

# MAXIMUM POWER COMPUTING atomic

Issue 60 | January 2006

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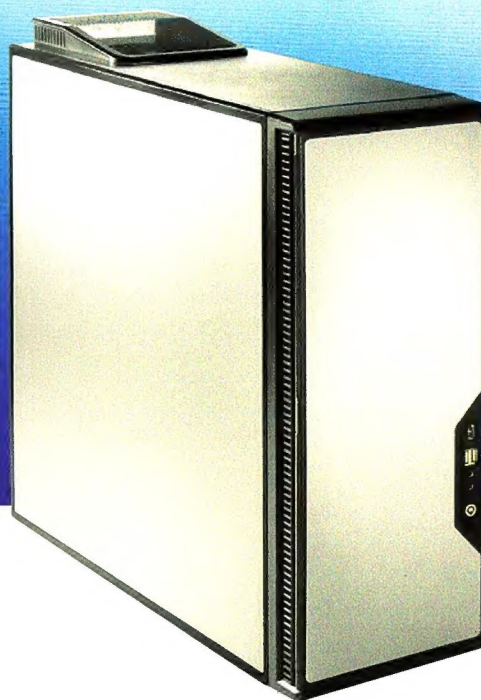
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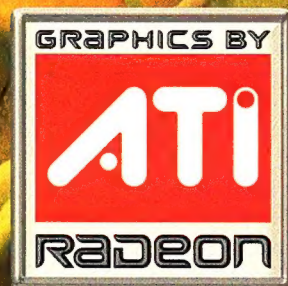
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**Happy Birthday ATOMIC!**



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## Shopaholic

**5** years! That's how long Atomic has been on this Earth, spreading its unique take on tech, its wit and its wisdom, and most importantly of all, its fun community atmosphere. More than just a magazine, it's now an icon of the geek culture we all live to varying degrees. Whether you're a hardcore freak who dreams of being a borg or you just like to dabble with the odd console game, Atomic is all about just enjoying and making the most of the gear in our lives. We live what we write here, and it's all inspired by what "you" get out of computing and games.

So here we are at our fifth birthday – 60 issues of awesome – and it feels like we're only just beginning. We've added so much to Atomic recently, and we've got plenty to more to give. This month we launched a spunky new service to Atomic online – Shop Atomic ([www.atomicmpc.com.au/shopping](http://www.atomicmpc.com.au/shopping)) powered by a swank engine called *Shop Ferret* – there are over 200 stores and some 290,000 products helping you search for the best prices on the latest kit. It's like Google for gear, only a million times cooler, and all the shops are Australian. Win!

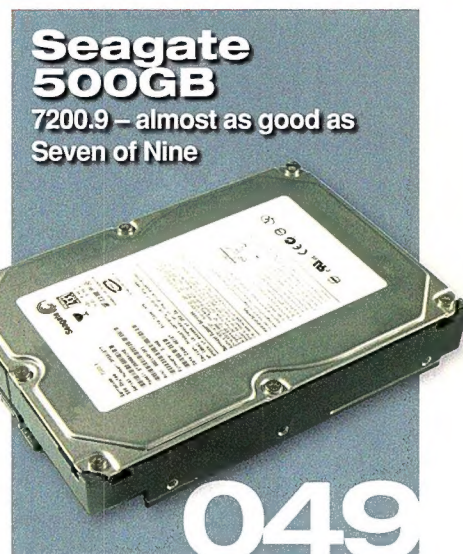
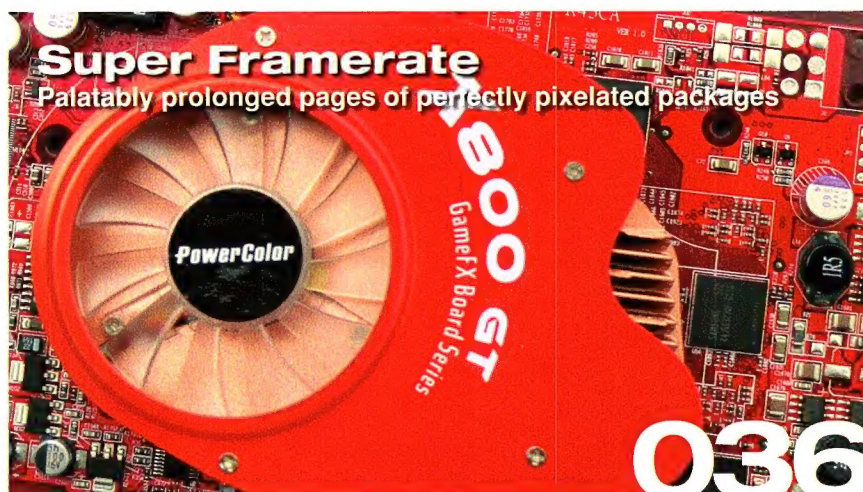
This issue actually goes onsale at Atomic Live 2005, the first event of its kind not only for Atomic, but Australia as well. The industry, tech, games, and the magazine are all brought together under the one roof (well, actually two!) at the Entertainment Quarter in Sydney. If you're here today, come and say hi, and if you couldn't make it, look out for coverage of the event online and in the next issue.

With all the new hardware that's been released and the wave of Christmas gaming titles we've enjoyed, it's going to be a great break over the new year. Enjoy the holiday season, and I'll see you next month.



Ashton Mills

[amills@atomicmpc.com.au](mailto:amills@atomicmpc.com.au)



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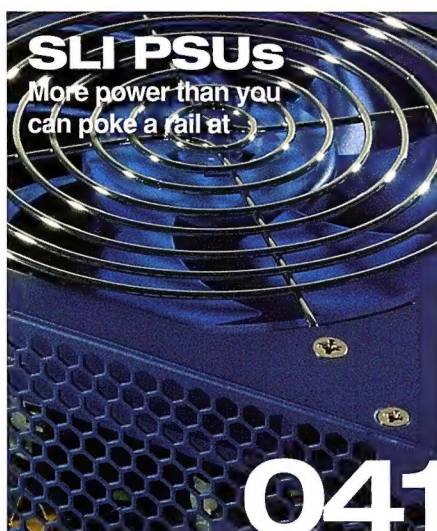
## COVER STORY ▼

# 060



## XBOX 360

The tech, the games, the goss. We go hammer, tongs and spatula on Microsoft's new console



## SLI PSUs

More power than you can poke a rail at

# 041



## Dell 24" LCD

Long live the king

# 047



## Girl Gaming

They exist, and they'll kick your arse

# 022

### LOGIN

Information, just the way you need it. Delectably digestible.

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Atomic does hardware like nobody else. Hot damn, that's sexy.

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### GAMEPLAY

Games are good. You know it, and we know it. Enjoy them here!

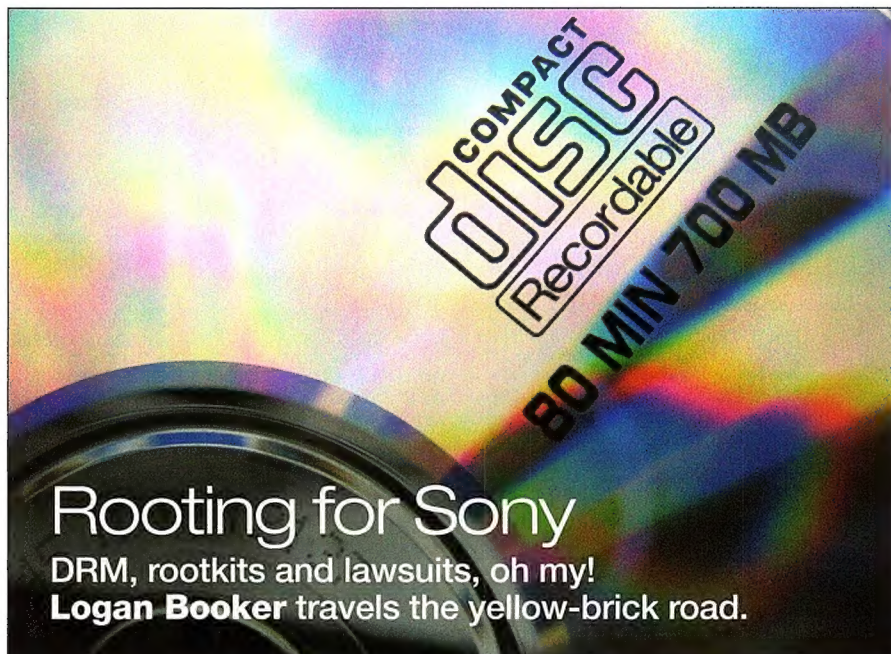
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**W**hen Sysinternal's Mark Russinovich decided to test the latest version of the company's rootkit detector on his work machine, he wasn't in the least prepared for what he found.

He wasn't expecting to find anything at all. Yet there in the results pane of the program resided a list of hidden apps running on his PC – apps he didn't remember installing.

RootKitRevealer, the detection tool Mark ran, was designed to uncover programs that use sneaky hooking functions or intercept API calls to obfuscate their presence. What legitimate developer in their right mind would want to do something like this to their program?

Well, logically none – rootkits are the domain of the virus writer, not the mainstream software developer. Regardless, a program, most likely malicious, had found its way on Mark's PC and being the inquisitive soul he is, Mark had to find out why it was there. With two degrees in computing science, two and a

half years of experience working at IBM under his belt and an army of applications just like RootKitRevealer to his name, Russinovich had more than enough knowledge and just the right tools to get to the bottom of things.

In an adventure that would lead him through execution stacks, obscure Windows APIs and more than a few memory dumps Russinovich discovered that Sony, or more accurately, a UK company called First 4 Internet was to blame.

The rootkit turned out to be part of a clandestine, and according to Mark's blog on his exploits, poorly coded, Digital Rights Management (DRM) mechanism. Packaged with Sony BMG (the company's music arm) CDs, the program secretly installs itself when the user plays the disc on their PC. Without the user's knowledge and with no mention in a EULA anywhere (until recently), the rootkit, dubbed 'XCP', would burrow itself into the operating system, never to be removed without a clean install.

Once Mark realised what he'd discovered, he was quick to post about it on his blog on the Sysinternals' website. October 31 would go down in history as the day Sony regretted ever putting XCP on its music CDs.

A few weeks on and Sony has taken a bashing from consumers and the media. Apparently the XCP software contacts First 4 Internet as it runs. According to research by security consultant Dan Kaminsky, some 500,000 domain name servers have had requests for the address the software points to, meaning potentially millions of users have the rootkit installed.

That's not the worst of it. In mere weeks virus writers have taken advantage of the stealth technology, hiding Trojan horses with the program's cloaking system that will hide any file with a certain name prefix. This, along with the discontent from users about having software installed on their system without their knowledge has put Sony in the bad books of many consumers.

Spyware cleaner and antivirus vendors such as Symantec, and even software giant Microsoft, have already added detection patterns for the XCP rootkit into their scanning software. Some, like MS, take the liberty of removing it themselves, while others just point to Sony's recently updated site that contains instructions on revealing the rootkit.

Although Sony BMG has said it won't change its stance on using the software, its actions tell another story. After supplying a patch to 'decloak' the software and email support to remove it, Sony BMG took steps to suspend production of CDs using the technology. Now, it's facing a lawsuit from the state of California in the US for deceiving customers on the nature of the software.

For a program designed to prevent users from making illegal copies of their music CDs, it sure does enough illegal actions of its own.



### #007 Consoles

With the Xbox 360 almost here and the Playstation 3 not far behind, we thought it right to go over the histories of everyone's favourite consoles.



### Super Nintendo/Sega Mega Drive 2

With the NES under its belt, Nintendo went out to hungry gamers with the Super NES, perhaps the most famous of all gaming consoles. Sega hit back hard with the Mega Drive, which was later shrunk into new packaging called the Mega Drive 2.

### 1970's

#### Magnavox Odyssey/Atari 2600

With the Odyssey in 1972 came the first of the gaming consoles. It gave birth to the first light gun, and spurred Atari to create the original 2600 console. While the Odyssey suffered from bad marketing, the 2600 took off.

### 1980's

#### Nintendo Entertainment System/Sega Master System

After the crash of gaming in the late 70s, it took a lot to get consumers interested in consoles again. Nintendo and Sega found the winning formula, leaving Atari to rot in video game history.

### 1990's



# Sounds like 'Shopaholic'

Our on-going quest to increase the perfection of your life takes another step, reports **Ben Mansill**.

The Atomic site has been enhanced with a new service for you. We call it Shop Atomic, but you'd do equally well calling it the 'cool search engine that instantly compares prices for tech gear across a huge range of Australian shops'.

Have a play with our search engine and witness its power. It's quite a toy. We're using Shop Ferret's technology, having found it to be powerful and comprehensive.

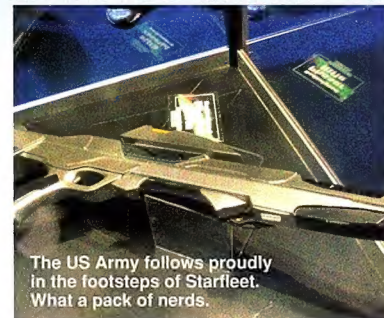
We hope you find this service useful and fun to use. The whole idea is to give you something extra on the site. We know you like tech and we know you like to know the price of new stuff, as well as watch prices change in the fast

moving commodity category, like RAM and CPU components. Atomic isn't involved if you buy stuff using Shop Atomic – it's not one of those 'add to trolley' jobs that are on some review sites. It's a search engine, pure and simple.

We've engineered it so the prices also appear on the pages of relevant reviews too – how convenient. There's also super-smart technology at work that recommends a similar product if what you're looking for isn't on the site. It's quite a wonder.

Every price is updated daily, too, so you can be sure before you buy what you're getting and for how much. The Atomic site continues to grow, and we hope you like our latest addition!

## short circuits



The US Army follows proudly in the footsteps of Starfleet. What a pack of nerds.

The US Government recently furthered the cause of non-lethal weapons by unveiling a futuristic-looking man-usable rifle that fires laser beams. Designed to blind and confuse the enemy, it's not exactly in the same league as the laser batteries on your local Star Destroyer, and it looks heavy as sin. Does this mean World War 3 will be a big game of Laser Zone?

Seems the US is busy these days with its R&D. The US Army is currently working on a special dental chewing gum for use by soldiers in the field, for those times when brushing just isn't practical. The gum, created by the Army Dental and Trauma Research Detachment in Illinois, reported works by destroying and preventing the build up of bacteria in the mouth.

A nasty vulnerability was recently discovered in the image rendering code of Microsoft's Windows XP operating system. Using the exploit, hackers can potentially create images in EMF or WMF format that can execute code on a user's machine simply by viewing the image. At the time of writing, no patch was available from Windows Update to correct the problem.

### PlayStation

Out of nowhere, Sony launched the Playstation and it was a crazy success. Sega was pimping its poor-performing Dreamcast and Nintendo struck back with the GameCube. Neither system offered Sony much competition and it wasn't until 2001 that a worthy opponent arrived.

### PlayStation 3/Xbox 360

The future is at hand. Really. The PS3 and Xbox 360 are looking fantastic and Nintendo is biting back with the quirky Revolution. Although Microsoft is first to market, fan boys will still wait in geeky anticipation for Sony and Nintendo to disgorge their new consoles.

1995

2000's

2005



### Xbox/PlayStation 2

If Sony entering the console market was a surprise, then heads exploded when Microsoft pushed its PC-based Xbox into the world of gaming. Powered by an Intel CPU and a next-generation NVIDIA graphics chip, it looked and played great. Sony of course was already on the ball with the next iteration of the PS console, the PS2.

Convergence is the new battlefield. We're at a turning point, where consoles aren't just used for gaming but for video, streaming music, viewing pictures and even building communities. Excitement awaits!



# 5 YEARS OF ATOMIC

**Bleary eyed, one day we looked up from our monitors and wondered how the heck we got here. That, and why we all had beards. Even the women.**

Issue 60 marks the fifth birthday of Atomic! Five years of fantastic, fun-filled technology and the pulling apart or destruction thereof. To mark this occasion we decided to take a look at the people, places, and events that have made Atomic what it is, raw and unadulterated.

## COMMUNITY MILESTONES

Apart from glue, paper, ink, and repeatedly beating Bill about the head and neck with a nearby stapler, what makes Atomic is the community. We've laughed, we've cried, we've shared things that perhaps we never should. However some events stand head, shoulders and dandruff above the others. Atomicans are a special lot, and how we've proved it.

- 05/03/04 Atomicans rally behind Bailey at BailAN, to help towards his life changing surgery  
<http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=29281>
- 01/01/05 Wedding of DonnaGem and Zephyr
- 28/02/05 - 09/03/05 Atomicans donate \$1532.00 to Multiple Sclerosis sufferers, thanks to Noddy dressing in a tutu and singing 'I'm a little teapot' on Pitt St, Sydney, aired nationally on 'Sunrise'  
[www.atomicmpc.com.au/forums.asp?s=1&c=1&t=58608](http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=58608)
- 20/03/05 Wedding of Vanna and LadyDeath
- 27/11/05 Atomic gets its own machinima, 'The Atomicans', courtesy of Lambo and Saponification

## ONLINE MOMUMENTS

Always prevalent on the online front, Atomicans have shared in some pretty special times both on and off the forums. Green slushies, nude competitions, textas on foreheads, talks with industry luminaries – we've seen it all. Well, except for Virtuoso

- 17/01/01 Website goes live

- 09/02/01 Official opening of #atomicIRC on Austnet
- 13/07/01 Mael's Atomic Waste Depot opens, Atomic's original sister site
- 25/09/01 Virtuoso hits 1,000 posts
- 05/10/01 InfoJunkie's Atomican Introduction Thread
- 28/10/01 Jesus, Just a Man??? thread – strains the server
- 25/09/03 Virtuoso hits 10,000 posts
- 22/10/03 The Infamous Atomic Naked Thread  
[www.atomicmpc.com.au/forums.asp?s=1&c=1&t=24439](http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=24439)
- 13/01/04 Launch of Forums v2.0
- 01/03/05 Noddy becomes a 'Fairy Princess'
- 22/03/05 Virt becomes a 'Resident Alien'
- 17/03/05 Virtuoso hits 20,000 posts
- 02/05/05 Launch of Forums v2.5
- 28/07/05 Atomic Extreme Reading Comp

## MAG STATS

How tall is Ashton if he stands on top of Bennett (hint: the same height)?  
How many beers can Ben drink before Logan looks attractive (12)?  
You know you want to know it, so here's all the knowing you need!

- First issue - 17/01/01
- First annual Cover CD - 11/01
- Ron Prouse's Chernobyl HSF Tester is born - 11/02
- Atomic is 50 issues old! - 02/05
- Total number of pages produced - 6182
- Total length of pages if placed end to end - 1.7km
- If you have every issue, the pile should be about this high - 30cm
- Approximate number of video cards reviewed - 220
- Approximate number of motherboards reviewed - 80
- Approximate amount of Arctic Silver fumes inhaled - 200cm
- Distance between Ashton and a can of V at any given time - 3ft



- Size of Ben's fan mail printouts - 3ft
- Bennett's Height - 3ft
- Closest Bill has been to a girl - 3ft
- Length of Logan's hair - 3ft

## WEB STATS

- Total Number of posts - 3,584,294 as of 30/11/2005 10:53am
- Size of database - Approx 8 GB
- Approximate number of posts per minute - 1.5
- Approximate number of posts Virtuoso makes per minute - 0.009
- Number of registered accounts - 39,276
- Number of banned accounts - 1,506
- Total number of Chuck Norris random facts - 73
- Total number of Gods - 17
- Total number of Moderators (including Gods and Evil Admins) - 19
- Heroes (including Supers) - 134
- How many times 'lol' has been said in forum - 97,706
- How many times 'badger' has been said - 2,655
- How many times Juggalo Scrub said 'blast...' - 226
- Specs for Server - **Then:** PIII 733Mhz 512MB RAM, 24GB HDD (Server was also shared with the PC Authority site at the time). **Now:** Dual P4 Xeon 2.4Ghz, 2GB RAM, and a Dual P4 Xeon 2.8Ghz, 2GB RAM Database server for content (shared with other sites).

## SMASHING EVENTS

With all the unresolved textual tension building on the forums, it was inevitable that eventually these people would want to meet. And m337 they did, with huge events being held up and down the east coast, inevitably involving cocktails of the Atomic kind. We salute the pioneers!

- |          |   |
|----------|---|
| 11/08/01 | First Sydney m337                             |
| 14/10/01 | First Sydney paintball                        |
| 18/01/02 | Atomic WorldLAN GibFragCON '97 XP (Melbourne) |
| 31/08/02 | First Melbourne Beer-a-thon                   |
| 17/01/03 | First Fallout (LAN, Sydney)                   |
| 01/11/03 | First Brisbane BBQ m337                       |
| 18/01/04 | Irradiate (LAN, Brisbane)                     |
| 08/01/05 | Radioactive LAN (Melbourne)                   |
| 27/02/05 | Race Around Atomic scavenger hunt (Sydney)    |
| 08/12/05 | Atomic Live (Sydney)                          |

## WISDOM FROM THE ELDERS

"Watching Atomic evolve is my favourite hobby. Ash and the guys have pumped out some bloody amazing stuff and I read every word, being a huge fan. I'd pay for this if it wasn't free for me! Logan's writing is a delight, Ash's tech features and reviews the best in the damn world and James, Dan, Tim, Craig and co are madly talented. 'sigh'. I'm as proud-as to see what little Atomic has become. We were pretty ballsey in the early days, finding our way mainly by trying new things every month. And now it's refined and perfect. Congrats to the team, you guys rock."

Ben Mansill

Ben wears the designer Atomic Scarf by ChaosLady...



While Ashton wears a sock on his head. Style.



Atomic's very own Noddy, is a teapot, short and stout.



Then... Issue 1



...Now Issue 60

"Atomic to me is being involved with something that I always wanted to do since I found that wonderful thing called The Internet back in 1991. Being able to do that something about something that I love, which is pulling apart computers and playing games on them, assuming I had put the computers back together correctly, is the icing on the cake.

And being able to do that something about the something I love with the greatest bunch of somebodies in the whole of everything is just the glaze on the cherry on the icing of a very nice cake indeed."

Dan 'Evil Admin' Godden

Five years ago I bought a subscription for a magazine that hadn't yet been printed and joined an online forum that was as empty as politician's promises. The irreverent writers wandered amongst us on the forums and IRC.

They responded to our queries. We felt cool just being near them. The defining moment in Atomic history where we, the readers, went from an online group to a full blown community, was Birthday Meet 1. Now part of folklore, we came from all round the country to get together. Although we had started identifying as Atomicans some time before, that night we cemented our bonds with the mag and with each other. As readers we grew along with the magazine.

We went through the window and neon stage, the overclocking till it bled stage, the bizarre cooling stage. The forums filled with questions and answers. As a community we grew by helping each other. Today we still whinge at changes in the magazine, cheer when one of us is elevated to a staff position. Laugh at the in-jokes. Atomic MPC's whole is greater than the sum of its parts and that's why it is so special to us.

@ramyre

Simon and Adrian, Bennett Ring, John Gillooly, Kate Marsden, Rik O'Hanlon, Angela McKinnon, Jamie Dickson, Tim McPherson, Tim Dean, Dan Rutter, Ron Prouse, Gramyre, Dan Godden, Simon Peppercorn, James Wang, Virt, moz, 1shot, Mac Dude, Hulkster, Spyder, Virul, Paraetorian, Mael and all past mods, every meet and event organiser, all our industry friends, distros and vendors.



# BLIZZCON

Blizzard's inaugural gaming convention was poops, giggles and hot chicks in costume. **Logan Booker** reports.

**F**or its duration of two days and two nights, BlizzCon turned Anaheim, California into a geek gaming Mecca. Located in the US, right next to the ever-famous Disneyland, the Anaheim Convention Centre was host to all manner of gaming paraphernalia and culture, from consoles and PCs to tabletop gaming and expensive-looking costumes. For the days of October 28 and 29, no one was safe from the influence of Blizzard fever. The month of October will always hold a special place in the heart of Blizzard fans. It will be remembered as the month the decade-old developer announced The Burning Crusade, the first official expansion to its popular, massively multiplayer World of Warcraft game, and the debut of its almost-complete Xbox and PS2 shooter, Starcraft: Ghost.

As expected, day one held most of the surprises. Mike Morhaime, president of Blizzard and one of the company's co-founders, welcomed the 8000 or so attendees in the opening speech of the day. In the same talk he announced The Burning Crusade expansion, highlighting its new features, including a new race, the Blood Elves (with another yet to be formally announced), and fresh areas to explore and quest in.

BlizzCon wasn't just about Blizzard though. Also in force was NVIDIA, Microsoft, gaming keyboard manufacturer ZBoard and Intel, showing their support for Blizzard's range of popular titles and the company itself. The expo area, where these companies resided for the convention's duration, was home to the table-top version of Warcraft and various publishers selling graphic and non-graphic novels based on the Warcraft and Starcraft universes. Scattered around these areas and most of the convention centre were PCs running World of Warcraft so players could log on and play if the impulse took them.



BlizzCon has gone down as yet another place a geek could consider heaven, along with the back room of a computer store and the back seat of a car.





There was plenty to see. The car in the above left shot isn't actually painted – the artwork is made of a special adhesive rubber and attached to the chassis. The shot on the right was taken from the entryway to the convention proper.

The main floor of the convention was home to two large playing areas. In one, attendees could jump in and check out a playable version of the WoW expansion. For the most part this involved running around the Blood Elf starting area and not much else, but it was enough of a sample to cause hour-long waits to play.

The second area was console heaven, showcasing the latest build of Starcraft: Ghost. There you could jump into 16-player MP and try out the two sides in the game, Zerg and Terran. Unfortunately, no single-player was available for attendees to play. Oddly, this area was underutilised on the first day but became gamer central on day two.

Separate from these two areas was a third section for World of Warcraft Battlegrounds. Part of the convention included a Battlegrounds competition, and this was held in that area.

The final part of the competition would have the winners up against Blizzard employees, so the fight for pole position was fierce – if you can call a bunch of dudes yelling out random geek acronyms (WTF?) and clicking like madmen on keyboards fierce.

Battlegrounds wasn't the only place competition was rampant. Blizzard itself hosted a number of normal and not-so-normal geek tests on the night of the first day.

These included a costume, sound-a-like and levelling competition. A cocktail party was also afforded some time that night, and players were able to mingle with Blizzard employees and discuss everything from Zerg strategies to class balance in WoW. It was a veritable who's-who of Blizzard's upper echelon.

As great as gaming was at BlizzCon, it was the developer panels that really made the show. Famous faces including Mike Morhaime, Tom Chilton, Scott Mercer, Rob Pardo and Scott Metzen threw themselves at the mercy of their many fans.

Panels such as the WoW class discussion and the items and professions talk drew large crowds, and although the eventual question

time at the end of these panels was gruelling, Blizzard was surprisingly candid with its players. It was obvious no matter which panel you went to that Blizzard wanted to be as honest as possible and although some left unsatisfied, most did not.

## It was a veritable who's-who of Blizzard's upper echelon.



Scott Mercer, Rob Pardo, Chris Metzen... if they worked at Blizzard then they were at BlizzCon.







Whether you came for the concept art, the gaming or the boobies, BlizzCon was able to cater in some fashion. Lines to play the World of Warcraft expansion were long, and while on the first day the queues for Starcraft: Ghost were non-existent, they were unmanageable on the second.

The second – and last – day of BlizzCon was similar to day one. People amazingly were still in costume and the line for Blizzard's merchandise remained insurmountably long.

Blizzard repeated a number of its panels for those who missed them the first time and both the Starcraft and World of Warcraft playing areas remained open. The exceptions were the Blizzard Invitational, where the top professional gamers from around the world played Starcraft and Warcraft 3 competitively – this was into the finals and drew a massive crowd – and Blizzard's contingent of paid-for models strutting around in Night Elf and Mage costumes.

The day ended with an appearance by Level 60 Elite Tauren Chieftain – Blizzard's own band headed by concept artist Sam 'Samwise' Didier – and The Offspring. Comedian Christian Finnegan (who you may remember as Chad from Dave Chappelle's 'Mad Real World') also made an appearance and was quick to bag out the entire audience for its love of MMO gaming. It's a miracle he wasn't mobbed when he left the stage.

The night's entertainment capped off BlizzCon, and there was no doubt in anyone's mind that the event was a success. It showcased not only World of Warcraft – for which most people attended – but also shed some light on the mysterious Starcraft: Ghost and allowed the developers to explain the decisions they made when creating their popular titles. Blizzard isn't sure when it will hold its next BlizzCon – all we know is that it will.

## World of Warcraft: The Burning Crusade highlights

Player level cap raised from 60 to 70.

New dungeons, including the Caverns of Time in Tanaris where players will be able to travel to the past and participate in famous Warcraft moments and Medivh's Tower in Deadwind Pass.

New area, called the Outlands, where players of levels 55-70 will be able to adventure. This area will include a dungeon or two.

Two new races, one of which is the Blood Elves for the Horde. We have it on good authority that the Alliance race will be the Pandaren.

Epic flying mounts.

Socketed items. Players will be able to customise their weapons and equipment further with special gems.

A new profession, Jewel Crafting. Players will be able to fashion neck and ring equipment, as well as gems for socketed items.

All-new talents and spells for players progressing from 60 to 70. This will include expanding the current 31-point talent trees into 41-point trees.

## When is it due?

Blizzard hasn't announced a formal date, but current speculation based on the playable demo at BlizzCon puts the expansion about a year away. In the meantime, Blizzard plans to add additional content via patches – which it has said will be meatier and more frequent than what they've been.

## Starcraft: Ghost highlights

- Involving and deep story, complete with Protoss, Zerg and seriously hot Ghost operative Nova.
- 16-player multiplayer with two sides: Zerg and Terran.
- Many game modes including variations of Capture and Hold, Team Deathmatch and Capture the Flag.
- Combination of Halo and Half-Life mod Natural Selection gameplay.
- Will be available on Xbox and PS2. No PC or GameCube versions planned.
- Blizzard expects a large online following.
- Multiplayer will not feature bots (computer-controlled opponents).
- Vehicles, ground and air, as well as a choice of four different classes for both Zerg and Terran in MP.

## When is it due?

Unlike the WoW expansion, Starcraft: Ghost is almost done and Blizzard is currently aiming at a release early next year. Considering the large number of delays the game has experienced it's hard to accept this as final. The multiplayer build available at BlizzCon however was extremely polished and playable.





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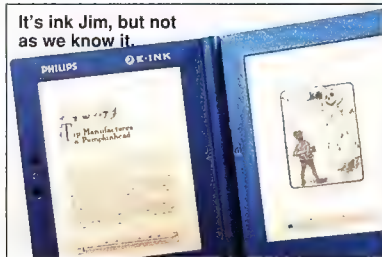


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## short circuits

It's ink Jim, but not as we know it.



A bunch of big name companies including LG and Fujitsu have embraced electronic ink, and plan to release displays based on the technology in the near future. While most of the super-flexible, low-power black and white screens will find their way into mobile phones, Fujitsu has developed a 10in colour display that could be used for any number of interesting tasks. Look out for them next year.

The latest advancement in optical computing has emerged from IBM in the form of a special chip capable of reducing the speed at which light travels, making it easier to read and transmit light-based signals. IBM claims it has manufactured the 'photonic silicon waveguide' using traditional materials like silicon and germanium, keeping the cost of making it low. Might be time to swap those electrons for photons.

## TOP 5 ...greatest gadgets of modern times

- 5 Remote control never leave the couch again.
- 4 Handheld consoles the Nintendo DS and Playstation Portable are just the beginning.
- 3 Flash drive we all have an indispensable USB flash drive, yes? Enough said.
- 2 MP3 player bonked the Walkman firmly over the head and is now the undisputed music device for boppers everywhere.
- 1 Mobile phone now paving the way for smart phones and other cool convergence stuff.



# futureproof

Quenching your thirst for the latest technology and hardware

## Cool carbon

Logan Booker checks out your next heatsink.

Carbon is often associated with one of two things. The first is a barbeque, complete with sausages, steak and chicken – possibly charcoal-coated depending on the skill of the person manning the barbeque. The second is Han Solo, frozen in a bronze-coloured block of everyone's favourite element.

Soon however, carbon will have a third association – heatsinks.

Plenty of media attention has been given to the wonders of carbon – from nanotubes to filtration – and it was inevitable that someone would discover how it could be used to cool CPUs and video cards. That someone is US company ThermoComposite, which has used unidirectional carbon fibres to create a heatsink that transfers heat like no other. By clumping these fibres together into a traditional heatsink design, ThermoComposite has been able to take advantage of the impressive thermal conductivity of carbon and carbon fibres to create one heck of an impressive heatsink.

ThermoComposite uses a special type of carbon fibre called ThermalGraph 7000X from US manufacturer Cytec. Behind this commercial name is a pitch-based carbon fibre that, while not as strong and flexible as more common polyacrylonitrile or PAN fibres, has incredible heat and electrical conductivity properties. The fibres are more than happy to transport heat rapidly along their length, depositing it wherever the fibre may end.

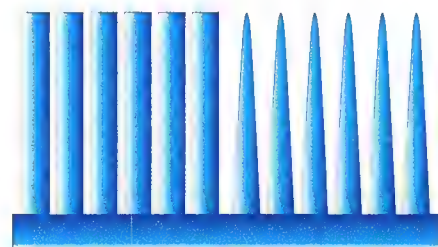
These fibres however are just a bit too good at doing this, so much so that the heat doesn't escape from anywhere other than the end of the fibre. ThermoComposite had to overcome this hurdle as the heatsink really wasn't taking

advantage of its carbon construction. So, the oblique pin was born.

Instead of using normal solid fins or pins, ThermoComposite designed sheared fins. What this does is expose the ends of the carbon fibres along the surface on the pin/fin improving the efficiency of the heatsink tremendously. The company also discovered that cutting the heatsink into pieces and simply 'placing' it back together only resulted in a minimal temperature increase in at the source.

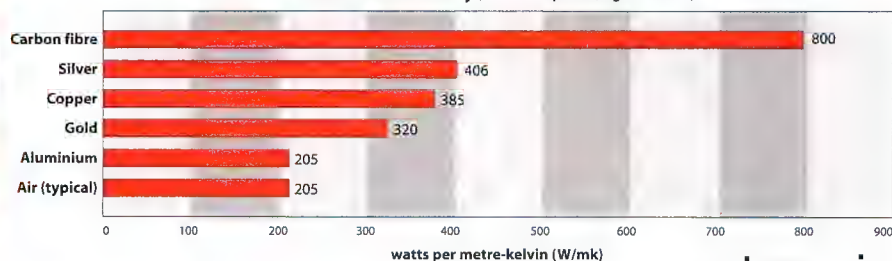
Carbon fibre is also much lighter than current heatsink metals – for every gram per cubic centimetre the carbon fibre material in the heatsink is almost nine times lighter than copper and close to half the weight of aluminium. Carbon is also resilient to gradual and rapid changes in heat, retaining its shape and conductivity many, many times better than copper or aluminium. Specially designed carbon fibre heatsinks can also distribute, concentrate and disperse heat in a variety of ways, simply by directing the fibres.

Does our cooling future rest with carbon fibre heatsinks? We'll have a better idea once we know how much they'll cost.



The key to the carbon fibre heatsink is the sheared pins, which expose a greater number of fibre ends to open air.

Thermal conductivity (at room temperature, higher is better)





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Z-access

The big picture behind technology and the world around us

## Exercising punishment

DRM punishes the innocent as well as the guilty. Tim Dean thinks this is perhaps a tad unfair.

**B**ack when I was in school, I was never terribly keen on gym classes. It's not just because my gross motor skills lagged somewhat behind my fine hand-eye coordination (hence my penchant for gaming), nor that I found long distance running to be the most soul destroyingly boring pursuit a human being can indulge in. It was because the gym teacher at my school was clearly, by a considerable margin, the least intelligent individual on school grounds. He knew it. We knew it. And he resorted to the only defence mechanisms available to him: authority and brutality.

One shining example of his intellectual calibre springs to mind. One gym period he was faced with only half a class. This was because the other half were fed up with his buffoonery and had wisely buggered off to a far end of the school to talk crap for 40 minutes instead of being made victim of his malicious physical torture, ostensibly called 'sport'. Unfortunately, I lacked the requisite insight to bludge that particular class, and was left with the depleted ranks of my brethren to face the wrath of the gym teacher.

He was clearly dismayed by the lack of participation of this class, and his walnut-sized mass of neurones strained to the conclusion that it was unlikely that a whole half of the class could be stricken down by some kind of malaise, and that at least some of the missing kids must have deliberately chosen not to participate. He was enraged.

His reaction? After a lengthy, and barely articulate, tirade about how disgusted he was with us for not taking gym class seriously, he cancelled whatever 'fun' activity he had in mind for us, and ordered us to run laps around the gym for the entirety of the class. This was, apparently, punishment for our collective lack of commitment to gym, and would serve as a lesson to make sure we turned up next time.

Unfortunately, there was only one flaw in his grand plan: he was punishing the wrong people. We're the ones who turned up. The ones who were happily (and ironically) playing backyard cricket on the other end of the school grounds, were blissfully unaffected by

the gym teachers punitive measures. Needless to say, once the bludgers heard of what had transpired in said gym class, they had determinedly resolved never to return – and the truants' ranks swelled by another half dozen members from that class onwards.

These days I look back on this episode more with pity for the gym teacher than the righteous indignation I felt back then, but I do get flashbacks from time to time. These flash backs are triggered by the same error in reasoning that afflicted my old gym teacher – the punishment of the innocent for the transgressions of the guilty. This is exactly what I feel happens with DRM.

DRM in things such as music downloaded from iTunes, or in game copy protection, or in DVD encryption, makes life harder for legitimate users. I'd even suggest that this drives some legitimate users to illegal practices, and possibly in greater numbers than it prevents pirates. For example, I refuse to be forced to leave the bloody CD in the drive when I play a game, especially annoying if I'm switching between games and need to keep putting in the correct CD. As such, as soon as I've installed a game and patched it, I immediately seek out a no-CD crack.

I'm not suggesting that we get rid of all protections of copyrighted material all together, but someone needs to inject some sense into this situation – especially before Windows Vista, with its PVP-OPM (PVP-Output Protection Management) hits. Protections need to be commensurate with the threat, and paranoia over the issue will surely result in locking things down more than is required, thus punishing innocent users unnecessarily.

So let's hope there are some people with brains bigger than walnuts who inject see reason before we're all forced back to reading books or, heaven forbid, running around outside.

Was Tim the kid in gym who always got the wedgie?

[tim@atomicmpc.com.au](mailto:tim@atomicmpc.com.au)



**There was only one flaw in his grand plan: he was punishing the wrong people.**



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# atomicchat

talking to the finest human beings on Earth...

## Peter Neate

It's a special Chat this month. Peter Neate gives you all the details of Blizzard's first pro-gaming event at BlizzCon.

It was a day and a half before the beginning of the event when I got my first glance at the inside of the Anaheim Convention Centre. Unsurprisingly it was still a mess, with the army of Blizzard employees running around like ants fixing last minute details as they tried to have everything ready on time.

At first glance, the stage for the Invitational Tournament game arena looked ideal. It was set dead in the middle of the BlizzCon convention hall, with rows of seats leading up to a raised platform where the two main computers were placed in front of a visually appealing backdrop. A commentator section was partially off to one side.

Directly behind the stage was an area cut off from the general population. There were about half a dozen tables with PCs on them, designated for the pro-gamers to rest or warm up on, as well as tables for food and members of the media that

were necessarily close to the action so they could report on the matches. Along the outside of this area was another row of PCs that made up the main section of the tournament area. This was where the majority of the games (that weren't televised) would be played. A metre and a half behind those PCs was the roped-off area from where the spectators could watch.

At this point there was a problem. In normal televised matches where the commentator is close to the action, both players are encased

in a sound-proof booth to eliminate outside noise.

This allows the players to concentrate on their game and, much more importantly, means that they can't hear the commentators. In the case of the Blizzard Invitational, there was no such booth.

On top of this Logitech had provided all of the gaming equipment



## atomicbio

Name **Peter Neate**  
Occupation **Professional Gamer**  
Websites **www.blizzcon.com**

Peter Neate is a professional gamer, having played Starcraft competitively both in his homeland of Australia and Korea (where he spent 2 1/2 years on the competitive circuit). Peter is the reigning Australian champion for Starcraft and has represented Australia four out of the last five years at the world finals. He currently lives in Brisbane, Queensland. His list of achievements include:

2001	Australian World Cyber Games, Third
2002	Australian World Cyber Games, First
2003	MBC 512-player Amateur League, Top 8
2003	KBK (Korea), Top 16
2004	ITV Team League (Korea), Second
2004	IntelCup (China), Third
2004	Australian World Cyber Games, First
2004	GameTV NeoGamer (Korea), Top 16
2005	MBC - MML, Top 16
2005	Australian World Cyber Games, First

for the tournament, but unfortunately all of the headsets that it had supplied were open-eared headsets (that let in lots of noise).

This was the biggest dilemma of the entire event. Fortunately it was quickly resolved – Blizzard went out and bought some enclosed headsets and some ear plugs (a tactic which is used in all Korean events – the ears are secured with rubber and the sound is turned up incredibly loud so you can't hear any outside noise). Not quite as good as a sound proofed booth, but the next best thing.

As far as tournaments go, BlizzCon was a bit of a disappointment in terms of gaming conditions. It lacked a proper 'tournament feel' – there was no gaming animosity between opponents and the whole thing was much more laid back than most competitions. The tournament area was a touch dark and the spectators were probably a bit too close to the main gaming area. In most tournaments spectators aren't allowed within about 10m of gamers as they have been known to give away critical information pertinent to the match by how they react to things taking place in the game. As a player, it's frustrating to have someone cry out 'Wow! He's going Arbiters!' and then watch your opponent instantly begin to counter your carefully planned attack. Thankfully, nothing like this happened at BlizzCon and the spectators were all well behaved.

For the gamers it was by far the most relaxed gaming atmosphere I've ever seen. This was possibly because of the small number of gamers competing with a very light schedule of gaming spread over the two days. On top of this, at most tournaments the competition is the main attraction, whereas at BlizzCon the tournament was just one of the



many sections that combined to make up the whole event.

For the spectators, the Invitational Tournament was such a rare treat – for many it is the only chance they will ever get to see some of the best gamers from around the world. Then of course there's the draw card: four of the top Korean Starcraft pro-gamers dressed up in their team's pro-gaming suits. I know of quite a few people who turned up just for the opportunity to see them.

Although there were translators available for the players for any issues that they might of had, for the spectators there was no way of overcoming the language barrier. When the gamers were free from obligations, the spectators who were in search of an autograph

and mouse clicks in a minute) and seeing it in the flesh. It's a mind-blowing experience.

The televised matches alternated, showing first one match of Starcraft followed by a Warcraft match. For the earlier rounds the seating provided was more than sufficient to hold the couple of hundred spectators on hand for every game. By either skillful design or pure luck, the line up to test the World of Warcraft expansion (which saw people queuing for periods of up to an hour during busy times) was adjacent to the seating section in front of the gaming arena. This allowed those in line to watch the matches as well. But when the business end of the tournament arrived on the second day, everything changed – the Blizzard guys handling the Invitational just couldn't

behind enemy lines and the commentator dubbed it 'Elroy the Probe'. It was quite pleasing to see the crowd erupt into applause when 'Elroy' managed to evade chase and make it back to friendlier territory. But because there was no in-depth analysis of gameplay and everything was simplified, some of the diehard fans were mildly annoyed. In my opinion it was a very good balance to help appeal to the audience as a whole and the commentators ended up doing a fantastic job.

With the success of the inaugural BlizzCon, we can be almost certain that there will be more held in the future. I even heard mutterings that the Invitational Tournament segment of BlizzCon was such a crowd pleaser that next time there will be almost no budget constraints,

peter neate

**“Being able to see pro-gamers compete on this sort of scale was incredible for most people...”**

or photograph often came up to them, but then they just ended up milling around, knowing exactly what they wanted but not quite how to go about it. On the first day, I ended up playing the role of translator every time I noticed this. By the second day, one of the managers had caught on to what was happening and ended up teaching the spectators a few Korean words so they could help themselves.

Just being able to see pro-gamers compete on this sort of scale was incredible for many in attendance anyway, but most people wouldn't have realised just how rare a treat it was to watch from so close a vantage point. For me personally, having watched thousands of live matches in my time, the opportunity to watch the players almost over their shoulders gave the events a new and exciting edge that on occasion proved too much even for me.

There is a large difference between knowing that a top pro-gamer can do 400 actions per minute (APM – a measuring tool among gamers, being the number of keyboard strokes

find enough seats to cater for the hordes of spectators that descended on the gaming arena. In the end there were still a thousand or more quite happy to stay standing while they watched the finals.

The crowds weren't anywhere near the tens of thousands that go to the large tournaments in Korea, but I am certain that this was one of the biggest (if not the biggest) spectator turn out in American history.

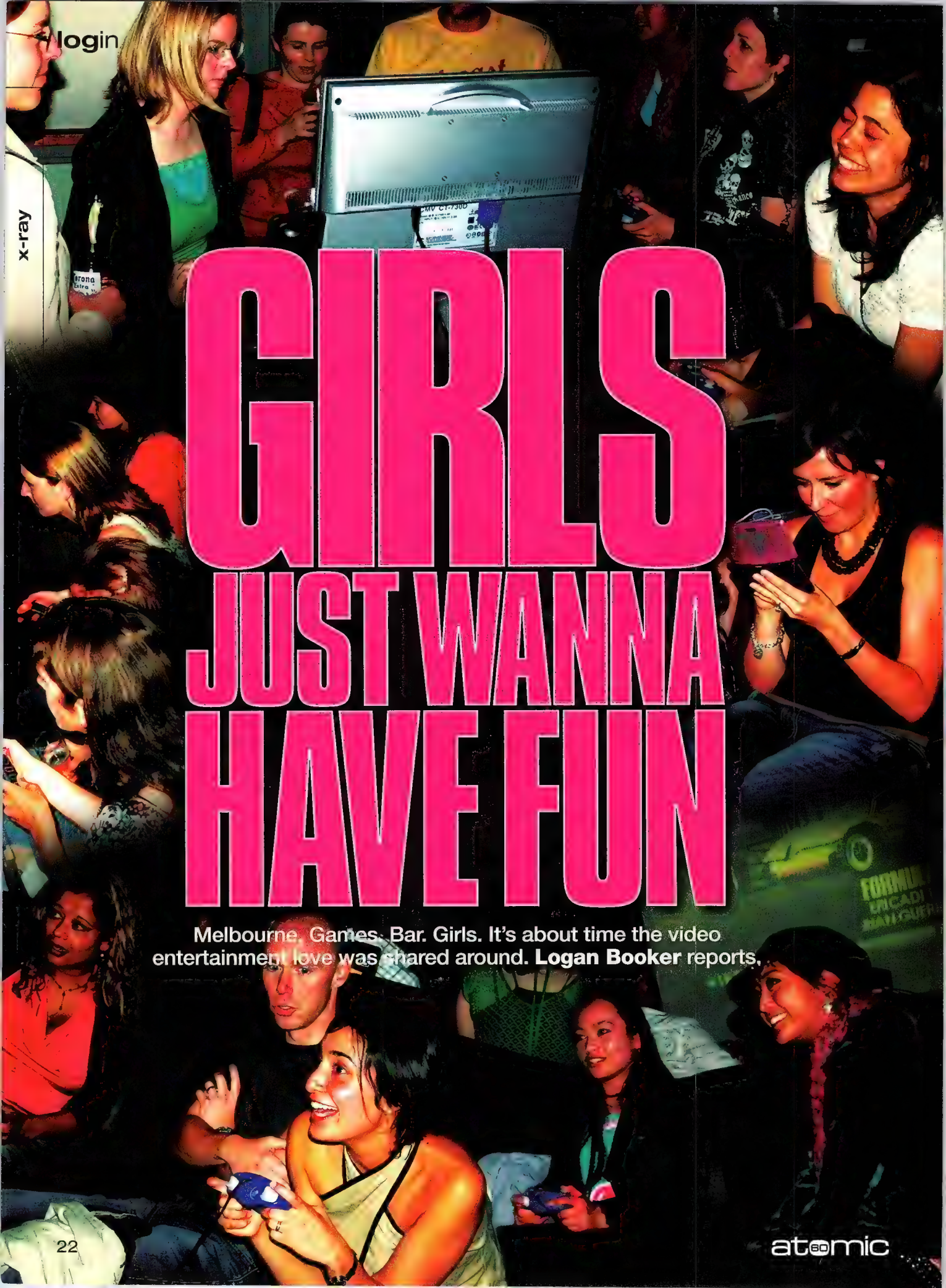
The commentators had done a lot of local gaming commentating, mainly over online radio, but they were instructed to not talk in specific gaming terminology, as is done in Korea. This is because the vast majority of people in attendance weren't hardcore followers and would just become lost in a jungle of jargon and lose interest.

So not only did they have to keep everything extremely basic, they had to try and involve the crowd into the events of the gameplay. At one point in a Starcraft match, a basic worker (probe) had survived for a long time

meaning bigger and better tournaments. This is a great thing – not just for the gamers who compete or the spectators who will go out of their way to watch – showcase events such as this can only be good for developing the profile and acceptance of e-Sports as a whole.

The BlizzCon Invitational, despite its flaws as a competitive tournament, was a huge success. There were no real dramas and it was such a laid back, friendly event that it was, by far, the most fun I've ever had at a tournament.





# GIRLS JUST WANNA HAVE FUN

Melbourne, Games Bar. Girls. It's about time the video entertainment love was shared around. **Logan Booker** reports.

x-ray

Arona

FORMULA  
LUCADI  
MAN GUER

atomic



**'Yes they exist, and yes while they know of the existence of video games, many are reluctant to join in... Until recently, no one has asked why. We've just assumed that we knew.'**

**E**ven with the hip-looking, mass market-aimed Xbox 360 out and about and handheld consoles like PlayStation Portable capable of playing music and videos as well as games, gaming itself remains a niche, geek hobby in the minds of the unenlightened. Sometimes it finds itself classed in the same league as collectable card games and stamp collecting, even though it's clear to anyone with a PC or console, and a life, that gaming doesn't mean the end of one's social activities.

At least, this is what we assume the average girl thinks. Yes they exist, and yes while they know of the existence of video games, many are reluctant to join in with the antics of their brothers, boyfriends and husbands. Until recently, no one has asked why. We've just assumed that we knew.

Turns out we didn't.

In the safety of Loop, one of Melbourne's trendier bars, 50-odd girls found their way into a gamer's paradise on November 26. Connected to projectors in the darkly-lit inner-city club were two Xboxes, a GameCube, a PlayStation 2 and resting in the corner with sleek LCD screens and even sleeker matt black cases, two PCs.

And they had games. Lots of games.

Resident Evil 4. World of Warcraft. Constantine. Burnout 3. Buzz. Tekken 4. No Sims, no Barbie's Shopping Simulator. These were real,

fun games that anybody could get into. And these beautiful lasses were getting into them.

The brainchild of Atomic columnist Kate Irabinet, the girls and gaming event was an attempt to get people of the female-persuasion into a comfortable environment that didn't attract the socially-reclusive images of basements and internet cafés. With drinks and friends to talk to in addition to numerous consoles and a pair of PCs to play, the scene was set to relax and have fun.

The big conversation point for the night was easily World of Warcraft. The massively multiplayer online role-playing game impressed the feminine onlookers with its strong story, its fantastic, luscious environments and the range of choices for player customisation. The sheer amount of character in the game, from the varying types of combat and non-combat pets to the player emotes and dances, kept the PCs running hot all night. Also up on a projector screen was a WoW raid group run, put together by Proudmoore guild Forbidden Alliance. It had no trouble getting itself quite an audience for its two hour duration. The raid, which consisted of four female members and five male, took on various challenges in-game that required the cooperation of all the raid's members to overcome.



LEFT: Kate and Sam hand out prizes on the night. RIGHT: A gamer getting into the World of Warcraft character generation. Though, this time, the person playing the female character is actually female for a change.





ABOVE LEFT: Mixing it up at the bar. An unrushed atmosphere helped the proceedings along greatly. BELOW LEFT: Furiousengel and Orphelia from the EliteGuard clan. ABOVE RIGHT: The girls relax on the couch for some socialising, drinking and Xboxing. As it should be!

Burnout 3 also drew a large crowd, with many eager to jump on and give the racing/crashing sim a go. There's nothing quite like driving an expensive car into a bunch of other expensive cars, and the girls at the event agreed. V8 Supercars 3 was also popular, the Australian-theme of the racer securing it a large amount of time inside one of the Xboxes.

Almost all the girls who had a chance to play the survival horror title Resident Evil on the GameCube agreed that the less-than-intuitive controls made it not only hard to play, but unwelcoming to new gamers. Resident Evil 4 on the other hand was all the rage, its over-the-shoulder view making the zombie shooter an instant favourite. In fact, one of the attendees, Rachael, admitted to spending a lot of time playing the PS2 version of RE4 at home along with her sister, who was also present on the night.

World of Warcraft and RE 4 weren't the only games that had girls hooked – third person action title Constantine also managed to make an impression. One girl, Zarina, spent most of the night tackling the game's demonic challenges, and many passers-by were impressed by the game's use of rendered cutscenes to further the story.

Not every game on the night afforded itself a warm response however. Dead or Alive Extreme Beach Volleyball for example was met with laughter by the event's female contingent. The swimsuits, the bouncing bits of anatomy and the sheer ridiculousness of the gameplay failed to impress. As mentioned previously, Resident Evil on GameCube also found itself quickly discarded as players grew frustrated over the awkward control mechanism.

The end of the night saw Buzz: The Music Quiz come out for the PS2. The four buzzers attached to the game's custom peripheral were quickly snatched up and it wasn't long before girls were answering all manner of music-orientated questions. Not only did they bag each other out for getting questions wrong, they also congratulated fellow competitors when they answered correctly. Although there was plenty of competition, it was definitely about having fun.

The girls and gaming event provided a great deal of insight into the minds of girls and their perceptions of gaming. Almost all who attended filled out a questionnaire about the night and their attitude towards



LEFT: Zarina proved her skill in Constantine by winning it this night. RIGHT: Furiousengel's Alanna games it's a busy ship in World of Warcraft.





The attendees gather around for the prize ceremony at Melbournian bar 'Loop', after a night of gaming fun. Watch out for the trojan males. Would they do a night like this again? Absolutely, and in fact for some of the attendees, games are already a part of their life.

gaming. The results were surprising – everyone had the mental image of a greasy, 16-year old kid as their image of a gamer or something similar. 'Male, homebound, socially retarded, obsessed, temperamental,' wrote one girl. 'Severely overweight or underweight, geek's tan (pasty white), arrogant, elitist and no girlfriend,' wrote another.

Part of the questionnaire asked girls to rank game characters from one to five, depending on whether they disliked or liked their appearance – with one being the lowest and five being the highest. Many found female characters from games such as Leisure Suit Larry, DOA: Extreme Beach Volleyball and even Metal Gear Solid degrading or offensive, while Alyx from Half-Life 2 proved popular.

'Awesome! Someone to identify with. Beautiful without being ridiculed for being female,' wrote one girl on Alyx while she described Leisure Suit Larry as 'Dull'.

Many agreed that game advertising was not aimed at them – in fact, the consensus was that most is aimed specifically at guys, and that the mediums (gaming magazine, for example) in which companies advertise is somewhat obscure to the female reader. One girl even wrote, 'Any [advertising aimed at girls] would be nice!'

The questionnaire also revealed that environment was a big influence when it came to picking up a gamepad or gripping a keyboard and mouse. When asked to describe their experiences with internet cafes (for those who had entered one), one girl wrote that they were 'much better than a games store,' however another said they felt 'lonely, isolated'. Mostly though they found them to be functional but void of anything (furniture, lightning, etc) that would make them a nice place to spend time, with one person writing, '[I] always felt rushed, only did what I had to do'.

So, next time you're trying to convince a female friend, family member or partner to try a game, why not hold the proceedings in more welcoming environment than a bedroom or attic? Make sure there's a social element and who knows – you might find their ideal game and finally get them hooked.

At Atomic we were so impressed with the event we'd like to run these on a regular basis – so if you're a girl gamer or know a girl gamer send us an email to [girlgaming@atomicmpc.com.au](mailto:girlgaming@atomicmpc.com.au) and we'll get back to you.

## Cheers to CW Supplies!

Extra special thanks to CW Supplies ([www.cws.net.au](http://www.cws.net.au)) in Melbourne for not only providing the PCs for the night, but also the door prize. Your help was greatly appreciated!

### PC specifications:

- \* AOPEN QF45 Black mid tower case
- \* AMD Athlon 64 3500+
- \* 1GB (2x 512MB) Corsair RAM
- \* Gigabyte K8NF-9 motherboard
- \* MSI NX6600GT PCI-E 128MB video card
- \* Logitech wireless keyboard and mouse
- \* CMV 17in CT730D 8ms LCD screen
- \* 80GB Maxtor MO SATA hard drive
- \* Liteon DVD ROM



Thanks to CW Supplies the door prize for the night was a fantastic black 5.0-megapixel Canon IXUS i zoom digital camera worth \$599! See [www.cws.net.au](http://www.cws.net.au) for great pricing on this and all the gear used on the night.



## Special thanks

Kate Inabinet, Atomic's Geekette columnist, for organising the event and being such a fantastic host.

Vivendi Universal Games for funding the venue, food and drinks. The event couldn't have happened without this brilliant support.

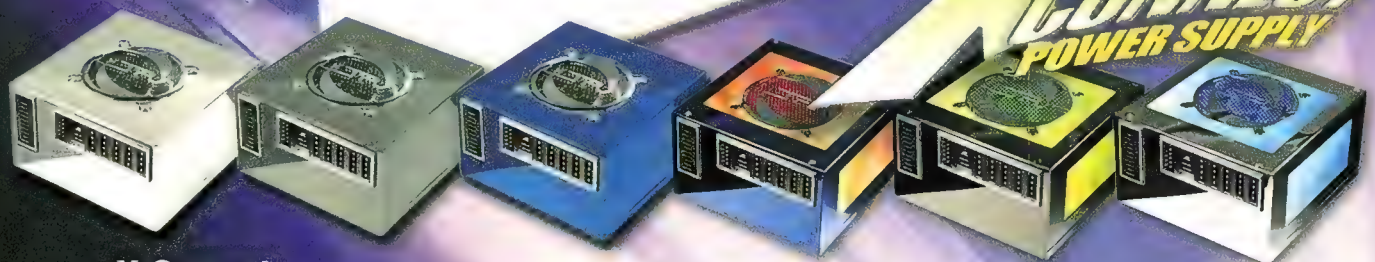
Thanks also to Acklavone, leader of Forbidden Alliance on Proudmoore for taking the time to organise the night's demonstration of a raid in World of Warcraft. And also to Sorscha, Tromage, Ginara, Dissolved, Joandra, Ne staying up so late to help out!





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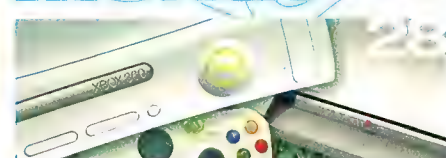
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# hardcore

News, reviews and round ups on the latest hardware technology for your box

this month



## Tech Trends

The world around us is a fascinating place. Here's the news you need to know.



## Ground Zero

Dan Rutter is the king of gadgets and all things gadgety. This month he shares his favourites.



## Gearbox

Gear and gadgets for you and your PC. Highlight this month: waffles, penguin stylez.



## SUPER Framerate

Need new graphics? Framerate is for you, and this month we have 10 cards for you to choose!



## Head to Head

Your PC likes power as much as you do, specially if it's an SLI beastie. Treat it to the best.



## Kitlog

The very best kit makes it into our hall of fame for recommended upgrades. It's all good.

hardcore reviews



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It's amazing how things can change so rapidly in the world of PC hardware. Just 12 months ago ATI seemed to have an unshakable lead in the graphics arena, and Intel still retained its huge advantage in the desktop market over AMD, even though savvy PC users had known for quite some time that AMD was the faster of the two.

But as 2005 closes, the roles have been reversed. NVIDIA has finally made a comeback with its 7800GTX. Sure, ATI has tried to retaliate with the X1800XT, but blow me down with a bike pump if I can't find any of these blighters in stores yet. Who said the days of paper launches were well and truly behind us? NVIDIA's catching up isn't that much of a surprise though, as it has proven in the past to be a company that can execute performance leading products on time and in quantity. But I really didn't expect AMD to do so well in '05, as this chip maker has rarely enjoyed a lead over Intel for any substantial period of time. Us Atomicians have known for years that AMD makes

blistering fast chips, but Joe Bloggs seemed eternally happy to have an 'Intel Inside' sticker plastered on to the front of his beige box.

Yet for the first time, AMD has surpassed Chipzilla in the desktop CPU market. Sure, it's only in the US, but the fact that retail desktops powered by AMD chips have outsold Intel two months running will surely have the higher ups at AMD queuing for pay rises. We're just glad to see that they're finally getting their long overdue returns.

If you asked me 12 months ago to predict that NVIDIA and AMD would be on top of the scrapheap come December 2005, I'd have had more luck predicting when Paris Hilton's next 'video' would hit the web. So who knows, this time next year I could be raving about the wonders of Matrox's new GPU, and how fast it will pummel your polys when paked up with a VIA CPU. But then again, I really doubt it...

between dreams to be on  
Dancing with the Stars.  
bring@atomicmpc.com.au





## short circuits



NVIDIA has turned to a cheaper version of its 6800 GT to fill the budget Christmas gap. The new chip, dubbed the 6800 GS, sports four less pixel shader processors than the vanilla 6800 GT, yet the core is clocked 75MHz faster. Benchmarks reportedly show the upped core compensating for the reduced shader processors, so the chip looks like it will have similar performance to the GT at a lower price point.

If budget graphics chips sound naff to you (they do to us), then perhaps the 7800GTX 512MB will spark your interest. This higher-clocked (550MHz core, 900/1800MHz RAM), memory-packed juggernaut should be available by the time you read this, with benchmarks at the time of writing showing roughly 20% better performance over both NVIDIA's 7800 GTX and ATI's X1800. We can't wait to get two of these running in SLI.

Rumours of an AGP version of ATI's X1800 appear to be false. As lovely an idea as this would be for all those users still hobbling away on a PCI Express-less motherboard, ATI has no plans at this time (nor in the foreseeable future) of supplying an AGP version of its flagship GPU. This is in line with a similar decision by NVIDIA not to supply AGP version of the 7800 GTX. Guess it's time to cry some more.

Dell has finally decided to move some of its desktop and mobile products onto AMD platforms after years of diligence to Pentium 4 and Pentium M. While Dell will continue to manufacture systems equipped with Intel chips, don't be surprised if you see faster and more wallet-friendly PCs and notebooks coming from the systems integrator. It's almost enough to make you buy a pre-built. Almost.

# tech trends

Quenching your thirst for the latest technology and hardware happenings



**V**ideo game consoles are like any technology – they're expensive when they first come out but get cheaper as they move closer to obsolescence. As a performance enthusiast, you become acutely aware of the price of everything technical you sink money into, and an Xbox or PlayStation is no different.

Have you ever taken the time to find out how much a console costs a company to make? Probably not, but there is one fact most people know. Microsoft and Sony lose money on the hardware with the intention of making it up in game sales.

A console without games isn't much of anything, and it is this fact that the two companies hedge their bets.

Except that the Xbox division of Microsoft represents a US\$4 billion hole in which money enters but never returns. So at what point did Microsoft plan on turning a profit?

Microsoft understood the gamble it was taking with the Xbox. Back in 2001, when it coughed up US\$500m for the Xbox kitty, it represented nothing more than a foot in the door of the now lucrative console gaming

business. Microsoft was one of only a few companies (like Sony) with the resources to build a console and suffer the early losses. Not only did it push out a console, MS invested online with Xbox Live, which was always a risky venture but has proven to be a crazy success – one MS will look to leverage in the future.

While the Xbox was always targeted at the gamer, Sony took the interesting route of advertising the original PlayStation as a hip, multi-functional device. Sony strongly pushed the CD playing capabilities of the PS along with its gaming potential, and it appealed to a lot more than just the SNES and Genesis crowd. The PS2 was no different – the console played DVDs, but it could also play games, making it the perfect lounge room companion.

The PS3 has however broken the trend. There will be no online service for the PS3 – a big mistake considering the prominence of the internet and online distribution – and there's been little to no talk of the multimedia capabilities of the unit. It's games all the way as far as Sony is concerned.

Now that both it and Microsoft are firmly established as the big players in the



## ...the Xbox division of Microsoft represents a US\$4 billion hole in which money enters but never returns.

console market – with Nintendo taking a less full-frontal approach with the Revolution – who has the competitive cost advantage?

Let's look at the processor hardware. Whereas the three PowerPC chips in the Xbox 360 will cost around US\$100, each Cell processor will set Sony back US\$150. Once you take into account Sony's R&D costs for developing Cell, there's already a large deficit for Sony to make up on the CPU alone.

For media, Sony is playing on the demands of future games and movies by incorporating a US\$100 Blu-Ray drive into the launch version of PS3.

Microsoft on the other hand will push the first Xbox 360s out with a standard US\$50 (perhaps even less) DVD drive and has plans to incorporate a HD-DVD drive into future models.

Reports are that MS doesn't plan to develop games for HD-DVD, which may keep gamers who buy the console early happy, but has angered developers who

feel that DVD is reaching its storage limits for current games. Again Sony loses out in the pricing department but is more future-proofed to an extent than the Xbox 360 – at least for now.

In fact, the only area the PS3 may have a cost advantage is in its GPU. NVIDIA is currently performing well against ATI on all fronts. With market pressure on ATI to catch up, NVIDIA will probably be able to afford to supply GPUs to the PS3 for a price less than ATI can to Microsoft.

In the short term, MS has the advantage. By the time you read this, the Xbox 360 will be available in the States for around US\$300, with year-on-year price cuts planned. The PS3 however is looking at a late-2006/early-2007 release at a wallet-defying US\$500.

This may come down depending on the uptake of Cell for use outside of the PS3, but the Xbox 360 will more than likely be half the price of the PS3 when it debuts, adding a cost disadvantage to the console's late arrival.



Nintendo has opted for a low-key entrance to the market with its next-generation console, the Revolution.

atomic

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## groundzero

Technology from the front lines.

## Stuff you should want

Tools and toys are much the same when it comes to gadgets, says Daniel Rutter.

It's a good life, being a gadget reviewer. Just in case you've been wondering.

The only down side to this gig is that I feel compelled to review every gadget I see. This can turn playing with toys into something that disturbingly resembles work.

So, in this column, I'm going to avoid writing thousands of words about several cool things I've acquired of late, by just telling you that they're cool.

The SeberTech ([www.sebertech.com](http://www.sebertech.com)) SeberGrip is a self-adjusting locking plier. Like Vise-Grips, it has a knob on the end of one handle. The SeberGrip knob doesn't move the jaws, though; it changes how hard you have to squeeze the handles before the mechanism locks, all by itself, onto an object of any size that'll fit in the wide-open jaws.

SeberGrips are big, chunky, serious pliers, suitable for heavy jobs, but much easier to use than Vise-Grips. (They're also more expensive and, as I write this, nobody in Australia seems to sell them, but these details need not detain us here.)

Still talking tools: I'm a fan of the little Victorinox MiniChamp pocket knife, but it's got some stuff I don't need. The little pen is a pain to use (I carry a Fisher Space Pen instead), and the cuticle pusher only sometimes comes in handy as a larger flathead screwdriver.

At least there's no fish scaler on the MiniChamp, but there **is** an 'emergency blade' I never use because I haven't yet been strapped into a car sinking into the ocean. And there's an orange peeling doodad whose main real purpose is mystifying people who don't know it's an orange peeling doodad.

So, if you're looking for a small Swiss Army knife for your geeky pocket, consider the Wenger Top Executive ([tinyurl.com/AVAYD](http://tinyurl.com/AVAYD)) instead. Wenger's scissors are better (serrated edge, smarter spring), and you also get a very small flathead screwdriver and a pig-stabber of a reamer/needle/awl. No girly tools (well, OK, a nail file), no superfluous blades, and traditional toothpick-'n'-tweezers – no dinky pen.

Are you a rugged outdoorsy type? Do you just

like setting things on fire? Get an Ultimate Survival BlastMatch ([tinyurl.com/BB29W](http://tinyurl.com/BB29W)).

The core of the BlastMatch is a darn great tent-peg of 'mischmetal', the pyrophoric mixture of rare earth elements that normal lighter 'flints' are made from. The other parts are a steel scraper, a spring and a plastic case.

Used correctly, the BlastMatch creates a shower of sparks that'll light all kinds of tinder. Used incorrectly, it'll cover your hand with tiny burn marks and set fire to the carpet. Perfect.

Need something to blow dust off things? 'Air duster' cans work well, but they don't often achieve anything that you couldn't do with a big rubber puffer bulb.

Unfortunately, there is to my knowledge only one company in the world that *makes* a big puffer bulb. Tiny bulbs with little brushes are easy to find, as are bigger bulbs that are adequate for de-dusting a camera lens, but useless for getting crumbs out of your laptop keyboard.

What you want (and, again, what you probably won't be able to find at any Australian retailer, though eBay is full of surprises...) is a Giotto's ([www.giottos.com](http://www.giottos.com)) Rocket-Air blower. Even the small models (and the angle-nozzled 'Q.ball' versions) are huge by crappy camera cleaning kit standards. A good squeeze gives near-air-duster cleaning power. And yes, they look like rockets. What more could you want?

Oh, and speaking of spray cans, the Hold-It ([www.hold-it.net](http://www.hold-it.net)) Tubular Straw Holder really does work. Almost everybody needs at least one. And nobody in the whole world who hasn't seen one in use has any chance of figuring out what they're for just by looking at one by itself. They look like some sort of obscure sex accessory.

Hold-Its are worth the price just for that, if you ask me.

What do you think is Dan's favourite gadget?

[dan@atomicmpc.com.au](mailto:dan@atomicmpc.com.au)



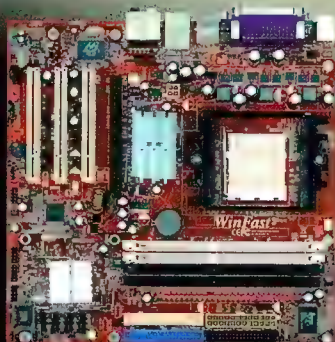
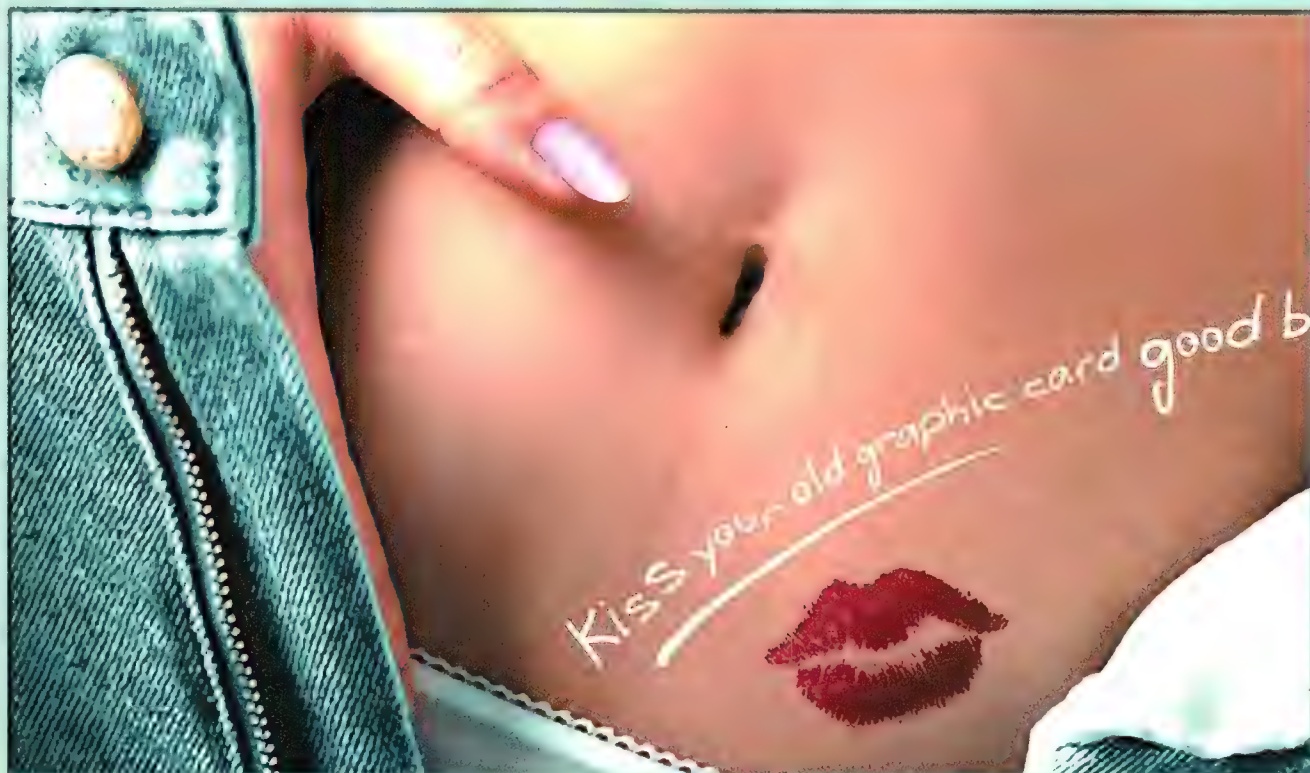
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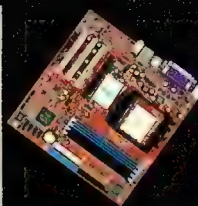
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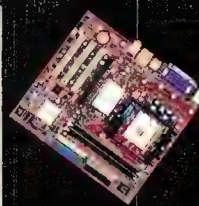
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Price **\$79.00, \$39.00 for add in boards**

Remember those keyboard overlays that came with games all those years ago, that helped you to remember which keys to press? The Z-Board is the natural evolution, allowing triple foldable modules to be snapped in for a customised gaming experience. Two boards are supplied, (normal and generic FPS), and a number of game specific variants are available. Key action is pleasant, although the split spacebar on some boards can cause headaches. Even more unnatural than natural keyboards, but nifty none the less!



## ROCK LCD cleaning kit

Supplier **Anyware**  
Website [www.anyware.com.au](http://www.anyware.com.au) Price **\$9.00**

Monitors, like your trousers, get dirty. Leave it long enough, and mountains of the crusty stuff can build up on your screen, spoiling colours and screwing up all that lovely detail you invested thousands of dollars to display. For CRTs, you can usually get away with a damp cloth or Windex (if you don't mind dissolving your anti-glare layer) but LCDs are a little more sensitive. They still need a good de-dirting however, so this ROCK kit is just the stuff for you – a specially designed cleaning fluid and super-soft, super-gentle cloths to do the deed dutifully. Don't let dirt mire your lovely display, clean it today!

## OCZ Rally USB drive 1GB

Supplier **AustraliaIT** Website [www.australiait.com.au](http://www.australiait.com.au)  
Price **\$135.00**

All USB drives are not made equal. Oddly enough, it's not just size that differs – they can vary quite a lot in terms of transfer speed too. OCZ, masters of the memory as they are, have turned their talents to making a new range of portable USB drives based on their popular memory modules, and boast a 'dual-channel' performance bonus. We're not so sure about this, since we're talking a standard USB 2.0 interface here, but the Rally does indeed zip files along at impressive speeds. It's also sleek, and lights up all blue-like when in standby. As far as USB drives go, it's one of the nicest.



## Vantec copper BGA RAM sinks

Supplier **Cool PC**  
Website [www.coolpc.com.au](http://www.coolpc.com.au) Price **\$15.00**

Got heat? Help dissipate it with Vantec's swank copper BGA RAM sinks, complete with self-adhesive thermal tape. Use these suckers (ahem) on RAM modules the likes of which you'll find in all sorts of weird places, like your PC. Or your cat, if you've got a borg-cat. In fact these simple and cheap heat sinks are ideal for the memory modules on modified video cards, especially if you're likely to go the Artic Cooling air or super silent water route for extreme performance. Best of all, not only do they keep your gear cool, but they *look* cool too.





### ▲ Altec Lansing inMotion IM7

Supplier Audion Australia Website [www.audion-mm.com](http://www.audion-mm.com) Price \$399.00

Slot any iPod into this beatbox and share the tunes with the whole room. Sound quality is extremely good and in pure Atomic fashion, we tested with a variety of music styles and volumes, and it still held up like a trooper. It'll charge your iPod while it's plugged in, and the S-Video out means you can stream Video iPod movies to the big screen. Like any proper boombox it will run on batteries too. But if the pricetag scares you, an alternative to the IM7 is a \$15 3.5mm to RCA cable and your existing stereo.

### ▼ Matrix Orbital MX-6

Supplier Dominion Electronics Website [www.dominion.net.au](http://www.dominion.net.au) Price \$160

Sporting a very Atomic green on black high resolution display, the Martrix Orbital MX-6 is the newest in a long line of funky drive bay displays. Hooking up through a USB port, it offers the usual trimmings, with default plug-ins supporting RSS, MBM, stock quotes, WinAmp, system stats, email, weather and pretty much whatever custom script you throw at it. Totally yum.



### ▼ A.C. Ryan Right Angled SATA Cable

Supplier Cool PC  
Website [www.coolpc.com.au](http://www.coolpc.com.au)  
Price \$5.00

If bling is your thing, then your thing can wing with... er... this. This being an A.C. Ryan SATA cable, of course, shown below in all its glowy graphic glory. Available in UV blue, red and green, this 30cm shiny plastic cable of joy will serve all your data SATA needs, especially if your drives find themselves in a tight spot and need the warm, loving caress of a 90 degree angle with flexible sleeving to ram it home.



### ◀ Woddles waffle maker

Supplier Sunbeam  
Website [www.coolcreations.com.au](http://www.coolcreations.com.au)  
Price \$29.95

You are not imagining things. Yes, this is a cooking device right here in Atomic! Why? Because it's so damn cool, that's why. For one, it's a waffle maker, and waffles are the ruling overlords of all flour-based dessert food stuffs. But more than this, it's a *penguin* waffle maker, and the penguins look just like Linux mascot Tux! No self-respecting geek could deny the nutritional and open source themed components of this wonderful kitchen appliance, and not instantly be overcome with hunger and the need to install a hardcore Linux distro. At least, that's what happened to us when we first laid eyes upon it. So, who wants waffles?







## ▼ i-Rocks iPod/MP3 CarDJ

Supplier **Anyware**  
Website [www.anyware.com.au](http://www.anyware.com.au)  
Price **\$69**

Don't you wish you could play the same music in the car as you do on your MP3 player? Well fear no more! Looking like a bloated car charger, the i-Rocks IPOD/MP3 CarDJ allows you to play your iPod or iPod Shuffle through your car speakers. Even better, you can even plug in your Flash USB Drive. Seriously, the Car DJ scans the Flash USB drive for MP3 files and plays them... how cool is that? It's also got a handy 3.5 headphone jack so you can plug in any audio device such as a portable CD player. Plug the CarDJ into the cigarette lighter and tune in your car's FM radio to the same frequency as the CarDJ, and away you go! You'll never have to hear a redneck talkback host ever again!

## ▲ i-Rocks nxt MP3 Audio Case

Supplier **Anyware** Website [www.anyware.com.au](http://www.anyware.com.au) Price **\$59.95**

For those on the go who still haven't joined the digital media revolution, the i-Rocks nxt MP3 Audio Case provides not only a place to store your tune frisbees, but features a curious 3.5mm audio jack which flips out upon opening. On further inspection, this connects to the front flap of the case, which amongst all the padding contains a nifty speaker and storage for the three required AAA batteries. Now you can annoy people on trains, in parks and other public places by sharing your love of speed thrash metal with all who care to pass, without the downer of having to lug speakers around.



## ▲ xRaider Illuminated Keyboard

Supplier **Flexiglow** Website [www.flexiglow.com.au](http://www.flexiglow.com.au) Price **\$69**

This is the big brother to Flexiglow's illuminated 'Multimedia Keyboard' reviewed back in Atomic 59. It uses the same Electro Luminescent back lighting which filters its cool blue up through the translucent white keys. This one though has full sized keys and is stock 101 design. We used it for a month solid, loving it all the way, when inexplicably the keys started to feel gummy and sticky. We're pretty sure nothing was spilt on it, yet the keys have become a little sticky. How very odd. It's a lovely keyboard, but if you get one make sure you can return it with no fuss if the gumminess strikes you. Gummy.





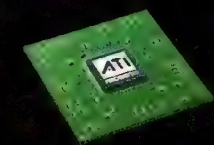
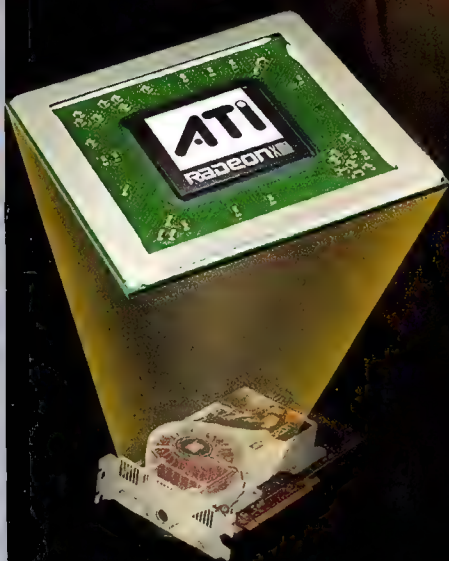


# ATI RADEON X1800 SERIES

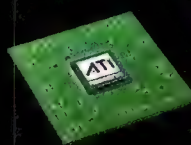
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[ati.com](http://ati.com)



# super framerate

Framerate goodness, super-sized for the Christmas season!

As our special Issue 60 birthday issue, we decided to pull on our party hats and whip up a special edition of Framerate – what we like to call a Super Framerate. We've hauled in all types of cards, starting with the absolute cream of the crop, ranging down through the well rounded models, and even covering the odd low-end one, for the Home Theatre PC buffs among you. Hopefully this will give you a decent snapshot on what products are worth spending your money on.

Over recent months in the video card arena, it's been great to see a lot of companies actually take notice of what people are saying about their products. One area in particular is the cooling mechanism. Far too frequently in the not too distant past, manufacturers tried to break open the potentially massive silent cooling market by shoving their 'passive heatsinks' down the marketing chute. This was bad.

The problem with passive cooling is that there is no peaceful collaboration between the words 'passive' and 'cooling'. Sure, there are industrial areas where natural convection (dissipation from heatsink to air without active assistance) is applicable, but these objects – such as power transformers – are significantly larger than your average high-performance graphics card, and therefore more resilient when it comes to high temperatures.

Now we're seeing a more realistic type of 'passive' card. These new models make use of the airflow already in the computer's casing, provided by case or CPU fans, for example. The issue with this system is the inherent rise in temperature of the item that now has to share its cooler. Fortunately they have all been lower-powered cards so far, so there haven't been any overheating problems yet.

Something else that's grabbed our attention is that NVIDIA is aggressively keeping the upper hand in the performance stakes. With news of NVIDIA's new 512MB edition of the GeForce 7800GTX, NVIDIA just keeps hitting back at the competition. ATI's ineffective, knee-jerk response to SLI – when it finally became a solid, physical entity we could actually test – was far too slow and insufficient to be competitive, even against NVIDIA's previous generation of cards. This was despite all the claims that Crossfire would, in fact, beat NVIDIA's current top of the line card upon release. Obviously there were a few misplaced decimal points somewhere.

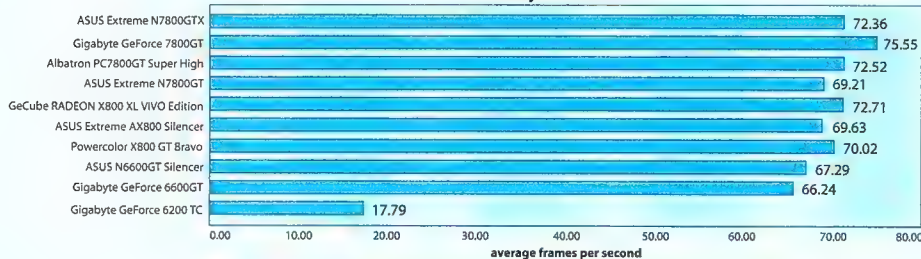
Still, it will be interesting to see who will pick up Crossfire, if indeed there is a solid market. It's possible that gamers with existing high-end ATI cards may consider moving over to Crossfire, as they will benefit most from having the additional card without the price of purchasing two new ones.

However, we wouldn't expect these people to be buying a master Crossfire card just yet, as they would instead wait for when they actually require a speed boost. Unfortunately, any performance boost gained from a second card may be pointless, as it may only take them up to the speed of one of the next generation cards that have just hit the market at the same price. This is a problem with both SLI and Crossfire, but it is greatly emphasised with ATI, as a Crossfire setup is already disappointingly slow. Don't get us wrong, we're all for running multiple cards, but it's a huge shame to see how poorly implemented Crossfire truly is. Here's to the continuing evolution of our beloved graphics subsystem.

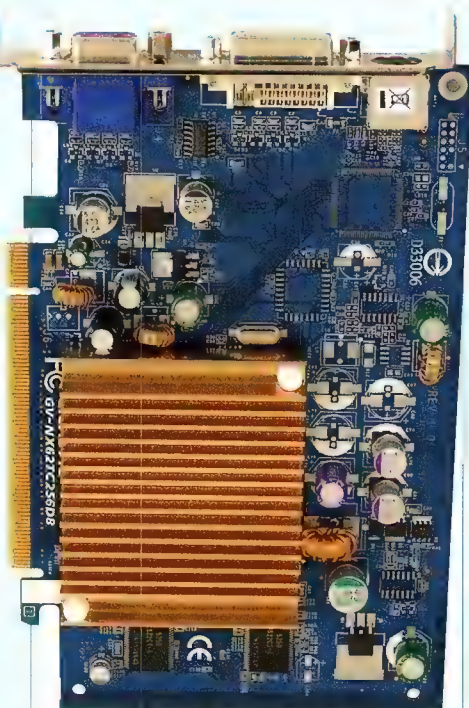
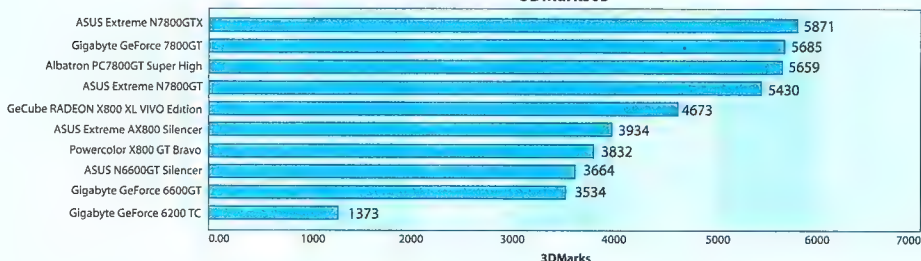
## Testing

Testing was carried out on our standard Framerate test bench, made up of our Intel 955XE motherboard with two 512MB sticks of DDR2 (533MHz), a Pentium 4 3.73GHz EE and Western Digital 36GB Raptor (10,000rpm). We use both Far Cry and 3DMark05 as they represent a good balance when it comes to testing both synthetic and real world differences.

FarCry - 1280 x 1024



3DMarks05



## Gigabyte GeForce 6200 TC

GPU NVIDIA GeForce 6200

TurboCache

Memory size 128MB (256MB with system RAM)

Core clock 350MHz

Effective memory clock 500MHz

Memory type 128-bit DDR

Pixel pipelines 4

Vertex shaders 3

Video out DVI; D-Sub adapters;

S-Video; composite

Price \$89

Supplier Gigabyte

Website [www.giga-byte.com.au](http://www.giga-byte.com.au)

Packing less heatsink than your average Northbridge chipset, this 6200 is one super quiet, cool running graphics card. It's also somewhat slow, as you may have seen, meaning this is no gaming card. One of the reasons to grab this card is that it sports component out, making it perfect for the Home Theatre PC, especially with NVIDIA's decent PureVideo decoder onboard. The 3D capabilities don't account for nothing, however, as the occasional bit of light gaming is completely possible and if you ask us, necessary. Superbly cheap with a great set of features, this is what you want for that lounge system.





### Gigabyte GeForce 6600GT

GPU **NVIDIA GeForce 6600GT**  
 Memory size **128MB**  
 Core clock **500MHz**  
 Effective memory clock **1000MHz**  
 Memory type **128-bit GDDR3**  
 Pixel pipelines **8**  
 Vertex shaders **3**  
 Video out **DVI; D-Sub; S-Video; component**  
 Price **\$239**  
 Supplier **Gigabyte**  
 Website **www.giga-byte.com.au**

Ah, there's absolutely nothing in the world quite like a run-of-the-mill GeForce 6600GT. When they first arrived in the labs, we were completely taken aback, and had to spend several long weeks recuperating in the crazy bin with the purple ninja monkeys (we love those guys). Yeah, we were ever so slightly overjoyed. Stock standard is exactly what this card is, but it's still managing to perform right up there with the best in the area of affordable grunt. Still, it only packs a meagre 128MB of memory, so if you're flicking on all the textures and options in your flashy new game, you should probably consider something with a little more bite.



### Gigabyte GeForce 7800GT

GPU **NVIDIA GeForce 7800GT**  
 Memory size **256MB**  
 Core clock **400MHz**  
 Effective memory clock **1000MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **20**  
 Vertex shaders **7**  
 Video out **DVI; D-Sub adapters; S-Video; component**  
 Video in **S-Video; composite**  
 Price **\$669**  
 Supplier **Gigabyte**  
 Website **www.giga-byte.com.au**

Even though it's clocked lower, this 7800GT managed to beat the others we have here by several frames. It could be just pot luck, but hey, we're not about to wet our pants over two or three frames. This is another top performing card, testament to the beefiness of NVIDIA's brilliant seventh generation of graphics chip. Equipped with a break-out box sporting VIVO ports, this is another beastly 7800GT that may do enough to strike your curiosity. Physically, it's identical to all the other 7800GTs, as only NVIDIA makes these babies. It simply comes down to what else it comes packaged with, brand preference and the price. Or perhaps the manly heatsink sticker.

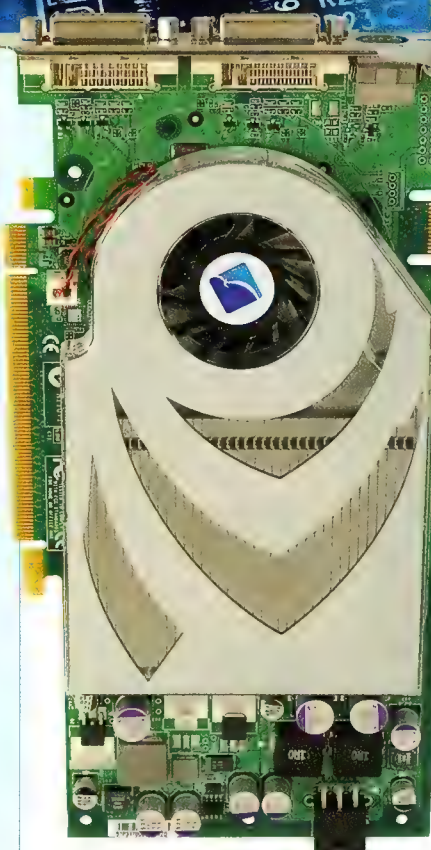


### ASUS Extreme AX800 Silencer

GPU **ATI RADEON X800**  
 Memory size **256MB**  
 Core clock **391MHz**  
 Effective memory clock **702MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **12**  
 Vertex shaders **6**  
 Video out **DVI; D-Sub adapters; S-Video; composite**  
 Video in **S-Video; composite**  
 Price **\$699**  
 Supplier **ASUS**  
 Website **www.asus.com.au**

One of ATI's cards also made it into the Silencer range, sporting the same quasi-passive system as the N6600GT Silencer. One of the great aspects that sets the X800 range apart is that it can run at fairly low temperatures. Having this card rely on the CPU cooler and some half decent case ventilation to draw out the heat is a highly acceptable cooling strategy which takes advantage of this low temperature performance. The problem with this card comes instead with the price, as it overtakes ASUS's own 7800GT, which is already amazingly quiet and also has VIVO capabilities. Nonetheless, if you're after a silent VIVO graphics card that can perform, this may be up your alley.





## Albatron PC7800GT Super High

GPU **NVIDIA GeForce 7800GT**  
 Memory size **256MB**  
 Core clock **450MHz**  
 Effective memory clock **1000MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **20**  
 Vertex shaders **7**  
 Video out **DVI; D-Sub adaptor; S-Video; composite; component**  
 Video in **S-Video; composite**  
 Price **\$639**  
 Supplier **AMI Computer Services**  
 Website **www.ami-computers.com**

The Super High aspect about this otherwise fairly ordinary 7800GT card has nothing to do with its disappointing, budget-bin software. It's kitted out with a fully featured VIVO package, sporting component, S-Video and composite out, as well as S-Video and composite in, but that's hardly it either. No, the Super Highness has to do with the card's default clock speed. It has been ramped up to a rather feisty 450MHz, in comparison to the default clock of 400MHz. This is an impressive feat and a good reason to purchase this little beast, especially considering that this overclocking is covered under warranty. Next to that, it's just another quiet, can-of-whoop-ass 7800GT.



## GeCube RADEON X800 XL VIVO Edition

GPU **ATI RADEON X800 XL**  
 Memory size **512MB**  
 Core clock **400MHz**  
 Effective memory clock **980MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **16**  
 Vertex shaders **6**  
 Video in **S-Video; composite**  
 Video out **DVI; D-Sub adaptors; component; composite; S-Video**  
 Price **\$410**  
 Supplier **Kingmax**  
 Website **www.kingmax.com.au**

Packing a fairly quiet cooling system, with a low-profile fan blowing over a copper-based heatsink, this card is definitely up for some hardcore gaming time, primarily because it comes packing a whopping 512MB of GDDR3 memory – you couldn't sneeze at this even if you wanted to. With this card you'll get to flick on all the high textures and options with the current crop of games, and watch as the graphics are displayed in all the glory that they were meant to be. Then you'll get to wait for the next generation of games to come out, as none of the current games actually makes use of this additional memory. Then why, you ask? Because 512MB is just so cool.



## ASUS N6600GT Silencer

GPU **NVIDIA GeForce 6600GT**  
 Memory size **256MB**  
 Core clock **500MHz**  
 Effective memory clock **1000MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **8**  
 Vertex shaders **3**  
 Video out **DVI; D-Sub; S-Video**  
 Price **\$359**  
 Supplier **ASUS**  
 Website **www.asus.com.au**

While it might not be considered exactly passive in nature, this video card doesn't actually come packaged with any form of active cooling. Instead, it's the perfect accompaniment if you have a top-down profile cooling setup for your CPU, as the heatsink on this card cleverly swivels out and over the CPU area. Rather than adding more unpleasant noise to your precious love box, this setup simply takes advantage of the existing air ventilation from your CPU cooler. It's a brilliant idea, but naturally you'll need to ensure your CPU can take that slight temperature hit that comes with the card. If it can, well then you're all set for a decent silent gaming rig on a tight-ish budget.





### ASUS Extreme N7800GT

GPU **NVIDIA GeForce 7800GT**  
 Memory size **256MB**  
 Core clock **400MHz**  
 Effective memory clock **1000MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **20**  
 Vertex shaders **7**  
 Video out **DVI; D-Sub adaptor; S-Video; composite; component**  
 Video in **S-Video; composite**  
 Price **\$649**  
 Supplier **ASUS**  
 Website **www.asus.com.au**

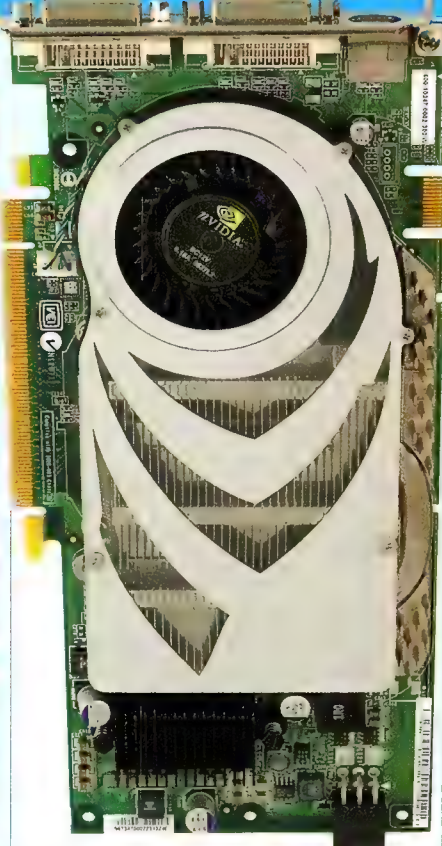
This 7800GT didn't manage to spit out the frames as fast as the Albatron, but then again, it is clocked down at the standard speed. It wouldn't at all surprise us if you managed to get in there and overclock this bad boy to 450MHz though, as it is essentially the exact same card. Unfortunately, that means that this one also comes with some forgettable software. On the upside, VIVO is handled in a much neater manner, using a break-out box rather than a bundle of tangled cables. This is another great pseudo-implementation of the 7800GT, and with blue LEDs throughout the aluminium heatsink, this unit is totally equipped to add some extra bling to your set-up.



### PowerColor X800 GT Bravo

GPU **ATI RADEON X800 GT**  
 Memory size **256MB**  
 Core clock **472MHz**  
 Effective memory clock **986MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **8**  
 Vertex shaders **6**  
 Video out **DVI; D-Sub; component; composite; S-Video**  
 Price **\$286**  
 Supplier **Australia IT**  
 Website **www.australiait.com.au**

With an apparent influx of cards that haven't completely been made up to scratch at ATI's fabrication plants, they've decided to create a cheap new card made up of all the left overs targetted at the budget market. Cheekily tagged the 'GT', this range of cards is made up of the ones that were manufactured to be something faster, but either overheated, didn't have fully working pipelines, or something else hindered them from operating as they otherwise should. Here they are ramped back and sold at fully functional, albeit cut-back speeds. This range doesn't have a set speed or standardised feature set, but they are, like this one, cheap and feisty.



### ASUS Extreme N7800GTX

GPU **NVIDIA GeForce 7800GTX**  
 Memory size **256MB**  
 Core clock **430MHz**  
 Effective memory clock **1200MHz**  
 Memory type **256-bit GDDR3**  
 Pixel pipelines **24**  
 Vertex shaders **8**  
 Video out **DVI; D-Sub adaptor; S-Video; composite; component**  
 Video in **S-Video; composite**  
 Price **\$999**  
 Supplier **ASUS**  
 Website **www.asus.com.au**

With more pixel pipelines and a whole 200MHz worth of additional memory speed in comparison to the 7800GT, the GTX isn't a card that likes to be sneezed at. Operating at essentially the same temperature and noise factor as a 7800GT, it has a tad more grunt in it. Well, theoretically at least. In the real world however, the performance differences between a GT and a GTX are minimal, so sneeze away. If you're after an even more deluxe card, perhaps stick around and wait for NVIDIA's 512MB edition of the 7800GTX. But if you're the impatient type, go out and get this for the instant gratification of having the most powerful card now.

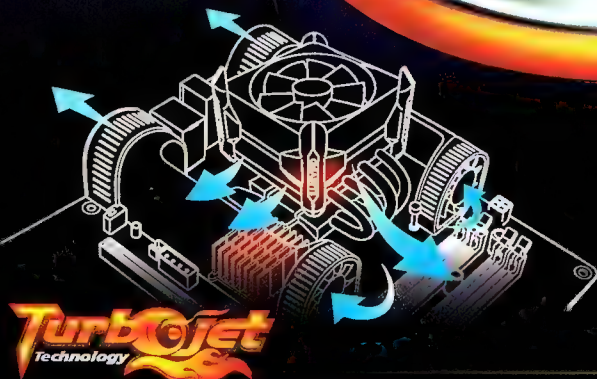
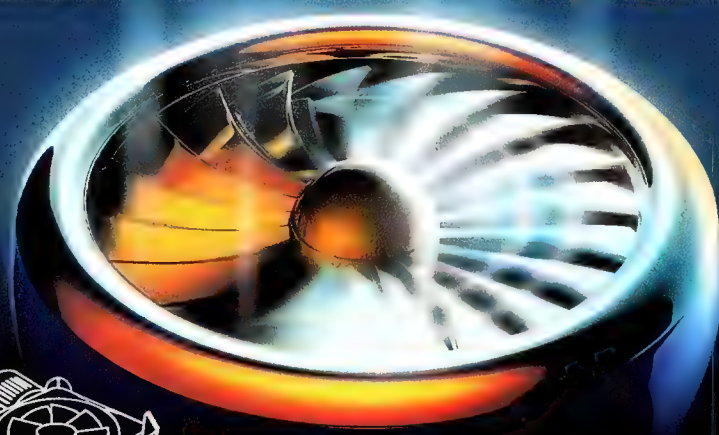


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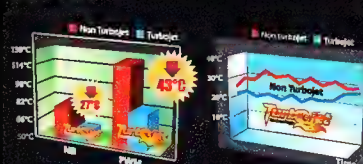


① Memory: 43°C  
② NorthBridge: 54.8°C  
③ Power Circuits: 63.5°C



① Memory: 61.2°C  
② NorthBridge: 95°C  
③ Power Circuits: 87°C

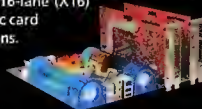
Temperature



★ This product does not include CPU cooler fan

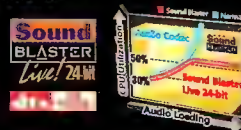
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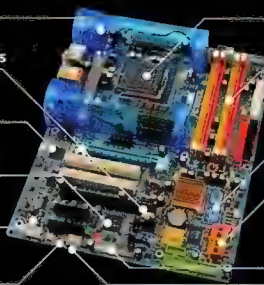
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**GIGABYTE**  
TECHNOLOGY



# headtohead

Bite-sized comparative round-ups of the hottest gear

## Power hungry

Your PC needs food too, so make sure you're feeding it enough juice. **Ashton Mills** takes a look at some of the most potent PSUs on the market.

There's a golden rule when it comes to power supplies: never buy one based on output power alone. There's more to power supplies than pumping out watts, especially when it comes to keeping your machine afloat while overclocking. These days it's more important than ever to use a PSU that supplies the juice you need *where* you need it most. So this month we've rounded up some of the latest and greatest SLI-capable power supplies you can find to power your dream system now and into the future.

### Power and efficiency

There are a number of things to look for when buying yourself a PSU.

First up, a good value to look out for is the *efficiency* of the unit, for two very good reasons: the conversion process from AC to DC is not a perfect science, and the quality of the design and parts used in a PSU will determine how efficient it does this.

If a PSU is 70 percent efficient then in order to supply 350W to your machine it will need to draw 500W from the wall. What happens to this excess energy being wasted in the conversion process? It's dissipated as heat, which is why your PSU often has at least one fan.

A high efficiency PSU then offers two key benefits: it will use less power, saving on your energy bill, and it will generate less heat, so it can get away with a quieter cooling system.

More than this is the fact that the hotter a unit gets, the less efficient it becomes. The less efficient it is, the more heat it generates and power it consumes and so on. So high efficiency = good. However, it's not the most important factor.

### Rails and stability

Power is supplied to your baby across power rails, the three most important of which are the

12V, 5V and 3.3V rails. In the past, the 5V and 3.3V rails were heavily loaded by our PCs, but in these days of GHz CPUs and overclocked video cards, the 12V rail has become the most important factor.

Generally, the 5V and 3.3V rails power your peripherals like PCI cards, the motherboard, and hard drives. The 12V rail primarily feeds the CPU and GPU. Usually, a PSU will come with at least two 12V rails, with one dedicated for the CPU. This is not a rule however, and some high-end PSUs will provide just one, high amperage, 12V rail – and it's the amps that really count. Overall it doesn't really matter how many rails you have, you're going to run into problems if the draw on a rail is higher than the PSU can supply. Which leads us, as it happens, to SLI.

### The power of two

So what separates an SLI-capable PSU apart from the rest? More than just a molex to six-pin adaptor, unfortunately. Modern graphics

cards demand a lot of power on the 12V rail. Especially when overclocking. If either the CPU or GPUs don't get a reliable feed, you'll get instabilities, crashes, and for severely overloaded units your PC may simply switch itself off. Which is unnerving at the best of times.

NVIDIA states that for a single 7800GTX the 12V rails (in total) of the PSU need to supply at least 26A, and 34A for two cards in SLI. It's worth noting that, right off the bat, most power supplies on the market can't match this rating. This is why there's been a recent shift to releasing 'SLI-capable' PSUs, and why we've decided to cover this new breed of PSUs here.

Generally, you can get away with a little less, but it depends on the cards you're using, the load, and the quality of the PSU. Be aware that overclocking CPUs and GPUs can actually draw a lot of extra power, more than you might expect. So if you're building a new SLI machine or your current system has odd instabilities, make sure your PSU is up to the task.

### HOW WE TESTED

Each PSU was hooked up to an overclocked A64 3500+ with 2GB of DDR RAM, two 10k RPM hard drives, DVD/RW drive, standard AMD HSF, and two rather tasty overclocked 7800GTX cards in SLI. This system consumes about 400W under load and represents what we consider to be a typical high-end rig. You want a PSU to have roughly a 20 percent ceiling above your max load, because the closer to its limit you get the less efficient it becomes. So for this particular setup, a 500W PSU would be good.

Strong and stable rails are a must – generally, your equipment is rated to perform within a five percent margin of the given voltage ratings, but if you overclock, these can have a greater effect on system stability. Contrary to popular belief, values reported by the motherboard BIOS or through software are notoriously inaccurate. The only way to measure exactly what your PSU is

doing is to tap into the rails themselves, and for this we used our trusty multimeter.

You *can* measure the 12V and 5V rails through a molex, but the values aren't accurate if the line is in use. To provide a repeatable comparison between PSUs, we positioned the probes inside the 24-pin ATX power connector and measured the rails while the PC was idle and under load using Aquamark and 3DMark05.





## FSP Blue Storm

Price **\$160** Distributor **Anyware** Website **www.anyware.com.au** Rated power **500W** Rated Efficiency **70%**  
 SLI certified **No** Connectors **1 x PCI-E, 2 x SATA, 8 x Molex, 1 x FDD**  
 Rated rails (total amps) 3.3V **30A** 5V **28A** 12V1 **15A** 12V2 **16A**

Although we put out the call for SLI power supplies (i.e. that have two PCI-E connectors and are rated to handle this) the Blue Storm arrived in our labs and we thought we'd test it anyway. Using a molex to 6-pin adapter for the second card, we loaded up the Blue Storm just

like all the other supplies. To its credit, it handled the load for our tests fine, although its 12V rail showed the greatest drop in all the PSUs tested here while under load. Flex-connect plugs and a quiet 120mm round up this cheap and cheerful package.



Measured rails (volts):	Idle	3.3V	<b>3.42</b>	5V	<b>5.08</b>	12V	<b>12.00</b>
	Load	3.3V	<b>3.41</b>	5V	<b>5.12</b>	12V	<b>11.65</b>

## Antec NeoHE 550

Price **\$229** Distributor **Altech** Website **www.altech.com.au** Rated power **550W** Rated Efficiency **85%**  
 SLI certified **Yes** Connectors **2 x PCI-E, 4 x SATA, 6 x Molex, 2 x FDD**  
 Rated rails (total amps) 3.3V **24A** 5V **20A** 12V1 **18A** 12V2 **18A** 12V3 **18A**

The big selling point for the NeoHE is a remarkably high rated efficiency of 85%, the highest of all the units tested here. Additionally, it provides ample power on three 12V rails at 18A each, easily enough for SLI cards and dual-core processors. Under load it held up excellently,

budgeting just .04 on the 12V rail, the same small drop as the popular PCP&C 510 SLI. With detachable braided cables and a reasonable price this unit is hard to beat. The only caveat is the 80mm fan, inherently noisier than a slower 120mm variant.



Measured rails (volts):	Idle	3.3V	<b>3.33</b>	5V	<b>4.99</b>	12V	<b>12.01</b>
	Load	3.3V	<b>3.33</b>	5V	<b>4.98</b>	12V	<b>11.96</b>

## Ultra X-finity 600

Price **\$189** Distributor **PC Case Gear** Website **www.pccasegear.com.au** Rated power **600W** Rated Efficiency **70%**  
 SLI certified **Yes** Connectors **2 x PCI-E, 4 x SATA, 8 x Molex, 2 x FDD**  
 Rated rails (total amps) 3.3V **25A** 5V **30A** 12V1 **18A** 12V2 **20A**

The Ultra X-finity comes from a line of popular Ultra PSUs, and this latest incarnation is a beastly 600W SLI-certified power house. Sporting a sleek silver mirror finish and matching silver foil shielded cables, this is definitely the PSU for you if you're fond of bling.

While its two 12V rails have plenty of juice, they weren't as stable under load. Dropping .33v places it just behind the FSP Blue Storm. That said, compared with the other SLI certified PSUs here it has a far more attractive price and plenty of juice, and so wins our Value award.



Measured rails (volts):	Idle	3.3V	<b>3.39</b>	5V	<b>5.22</b>	12V	<b>12.14</b>
	Load	3.3V	<b>3.36</b>	5V	<b>5.25</b>	12V	<b>11.81</b>

## PC Power and Cooling Turbo-Cool 510 SLI

Price **\$386** Distributor **PC Case Gear** Website **www.pccasegear.com.au** Rated power **510W** Rated Efficiency **70%**  
 SLI certified **Yes** Connectors **2x PCI-E, 6 x SATA, 8 x Molex, 1 x FDD**  
 Rated rails (total amps) 3.3V **30A** 5V **40A** 12V1 **34A**

Despite its modest 510W rating, the PCP&C 510 SLI can pump 650W at its peak. As the first power supply officially endorsed by NVIDIA for SLI, it clearly meets the requirements with a beefy 34A on its single 12v rail. Renowned as perhaps the best PSU money can buy, it also

sports a price tag to match and is the most expensive unit tested here. Its performance however is rock solid, barely faltering on the load tests. Ostensibly to reduce noise, the single 80mm fan has just three blades, but never the less is still audible under load.



Measured rails (volts):	Idle	3.3V	<b>3.36</b>	5V	<b>5.15</b>	12V	<b>12.13</b>
	Load	3.3V	<b>3.35</b>	5V	<b>5.12</b>	12V	<b>12.09</b>



## Coolermaster Real Power 550W

Price **\$239** Distributor **Coolermaster** Website **www.coolermaster.com** Rated power **550W** Rated Efficiency **75%**  
 SLI certified **Yes** Connectors **2x PCI-E, 3 x SATA, 6 x Molex, 1 x FDD**  
 Rated rails (total amps) 3.3V **30A** 5V **30A** 12V1 **18A** 12V2 **20A** 12V3 **10A**

Also with a peak power of 650W and a rated 75% efficiency, CoolerMaster's Real Power 550W is the only CoolerMaster PSU currently SLI certified. In the load tests it held up well, but not quite as good as the competition. On the other hand its single 120mm fan is nice and

quiet. It was also the only PSU to come with a nifty extra – an analogue meter to show total watts in use. While MGE's Magnum 500W PSU does this better with an LCD display, at least you can place this one in the front of your case. All up a solid, mid-range, fully-featured entry.

Measured rails (volts):	Idle	3.3V	<b>3.38</b>	5V	<b>5.10</b>	12V	<b>12.05</b>
	Load	3.3V	<b>3.36</b>	5V	<b>5.15</b>	12V	<b>11.77</b>



## Thermaltake PurePower 680W

Price **\$259** Distributor **Thermaltake** Website **www.thermaltake.com.au** Rated power **680W** Rated Efficiency **70%**  
 SLI certified **Yes** Connectors **2 x PCI-E, 4 x SATA, 10 x Molex, 2 x FDD**  
 Rated rails (total amps) 3.3V **28A** 5V **50A** 12V1 **15A** 12V2 **15A** 12V3 **8A**

Yegads! This nuclear power station rates at a massive 680W of juice, just in case you want to power your mate's PC as well as your own. Three 12V rails distribute the juice but a lot of the power is going into a big 50A on the 5V rail – good if you plan to run a lot of drives,

reflected by its 10 Molex connectors. Two 80mm fans cool this behemoth and sleeved cables keep the many connectors organised. Performance wise the PurePower sits in the middle of the units tested here, registering a .18V drop on the 12V rail while under load.

Measured rails (volts):	Idle	3.3V	<b>3.40</b>	5V	<b>5.13</b>	12V	<b>12.16</b>
	Load	3.3V	<b>3.38</b>	5V	<b>5.11</b>	12V	<b>11.98</b>



## Seasonic S12 600

Price **\$249** Distributor **PC Case Gear** Website **www.pccasegear.com.au** Rated power **600W** Rated Efficiency **80%**  
 SLI certified **Yes** Connectors **2x PCI-E, 4 x SATA, 6 x Molex, 2 x FDD**  
 Rated rails (total amps) 3.3V **30A** 5V **30A** 12V1 **18A** 12V2 **18A**

Seasonic is a little known brand in Australia, but overseas they have a formidable reputation as reliable and quiet PSUs. Indeed in the load tests the S12 600 held up exceptionally, matching the small .04 drop in the 12V rail the PCP&C 510 SLI and Antec NeoHE managed.

Unlike these PSUs however, the S12 600 uses a single 120mm fan that, true to reputation, is almost silent to the ear. Wonderful. With a rated efficiency up to 80%, solid stability of the rails, and coming in cheaper than the PP&C 510 SLI, the S12 600 wins our Performance Hot Award.

Measured rails (volts):	Idle	3.3V	<b>3.33</b>	5V	<b>5.01</b>	12V	<b>12.10</b>
	Load	3.3V	<b>3.32</b>	5V	<b>5.00</b>	12V	<b>12.06</b>



## Conclusion

There's more to the ideal PSU than price, power ratings and rails. All of the PSUs listed here conform to at least the ATX v2 standard and feature protection measures such as short circuit, voltage overload and excessive current protection. All are essential to protect your gear from going boom in the event of power problems or user error.

Note that when shopping for a PSU you will often also see advertised the power factor (PF) rating of a PSU, and any good PSU will have Active PFC (power factor correction). The higher

the better, as it means a cleaner current to your box, but don't believe the hype about it saving you power, because it won't. And if you're into silence, look for those with 120mm fans which can afford to run at a lower RPM.

Generally, though, the most important features to look out for are the total wattage of the PSU and at least 34A on the (combined) 12V rail to feed your overclocked CPU and dual-video cards the juice they crave.

Speaking of which, how do you know how much power is enough for your PC? Unless you have a PSU like the CoolerMaster Real

Power 550W with its analogue display of your machine's power draw, the best you can do for the configuration of your specific system is to get an approximate amount using an online PSU calculator, like the excellent one at Extreme Outervision: **extreme.outervision.com**.

Note these wonderful calculators are only a guide, but they're a darnsight easier than sitting down and trying to work it out yourself.

Lastly, keep in mind power supplies will happily hum along for many years, so buy a little ahead if you're planning to upgrade your CPU or add another video card down the track.



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## RAVE REVIEWS

cont.

Aug. 26, 2005

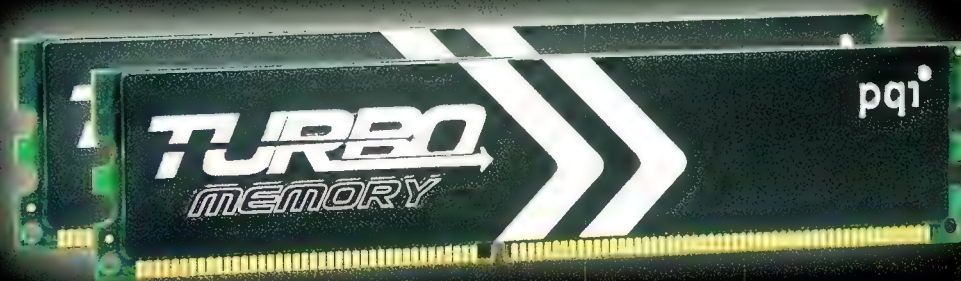
"Absolutely exceptional memory capable of lower latency timings at stock speeds and still pull through with a jaw dropping overclock to boot."

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THE ULTIMATE MEMORY FOR hardcore GAMERS



# Gigabyte GA-8N-SLI Quad Royal

Craig Simms, resplendent in lycra, goes for the Royal Rumble.

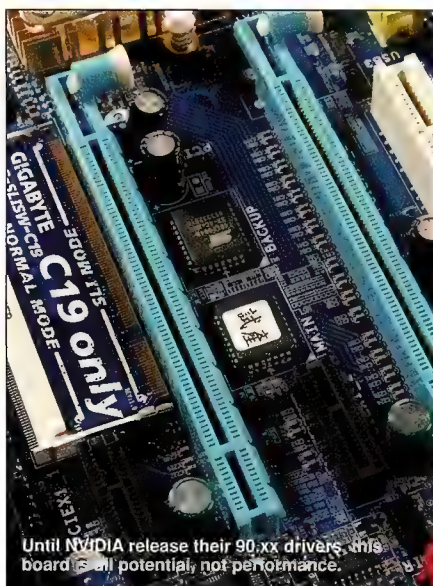
Price \$369

Supplier Gigabyte

Website [www.gigabyte.com.tw](http://www.gigabyte.com.tw)

Specifications: NVIDIA nForce4 SLI;  
4x DDR2 DIMM slots; 4x SATA;  
1x PCI; 2x PCI-E x1; 4x PCI-E x16;  
AC97 eight-channel audio.

The first question that's always asked when spying this nForce-based LGA775 Intel board is: 'does it do quad SLI?' to which the answer is 'maybe one day.' Until NVIDIA adds driver support for more than two cards in SLI, this board will be little more than something for those with special needs rather than enthusiasts.



Until NVIDIA release their 90.xx drivers, this board is all potential, not performance.

Right now it's capable of bog-standard SLI, or up to four independent PCI-E cards for a total of up to eight monitors – however cheaper alternatives exist that give the same effect, providing you're willing to sacrifice graphical power. Lane configurations for the slots are set through the BIOS, with 1/16/16/1, x/16/8/8, 8/8/16/x and 8/8/8/8 combinations available,

where x equals a disabled slot. Throwing the requisite four cards is an exercise in balance, as it means you lose access to two PCI-E x1 slots, a PCI slot and if you have a full-length GTX card, your IDE1 port as well. Further hijinks ensue if you have a full-length card in the first slot, as it has to be removed if you want to get at the RAM. The second slot comes with its own problems, particularly the access to the card release – being caught between the card heatsink and some poorly placed capacitors leaves scarce room for fingers, which means using a set of pliers just to be able to get the card out. SLI switching is still done through a switch module rather than in software.

Large aftermarket HSFs may prove a problem due to three tall capacitors around the socket, and the huge passive heatsink on the northbridge coming in at around three times taller than the active sitting on the southbridge – however we managed to attach the enormous Ninja Scythe with no clearance issues. Despite this, the board is clearly designed around the reference Intel HSF.

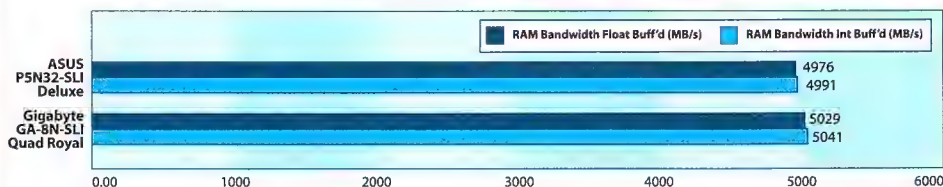
Aside from the obvious, the features are standard fare with 4 DDR2 DIMMs available for a maximum of 8GB RAM; two PCI-E x1;

one PCI; two PCI-E; Gigabit Ethernet, four SATA II; one FireWire; two ATA133; one FDD; coax and optical SPDIF outputs; four USB ports (up to ten if you hook up the internal connectors to an external bracket) and a legacy parallel port. Audio is provided through the Realtek ALC850 AC97 codec, which does the job without being spectacular. The SATA ports support RAID 0, 1, 0+1 and 5 through the CK804 southbridge.

Nothing we did would make the board happy with our Pentium 4 3.73GHz EE, so we managed to scrounge up a P4 660 3.6GHz to test with. Paired with 2x 1GB Geil DDR 5300 sticks, SiSoft Sandra 2005 tests showed negligible difference between the Quad Royal and our reference Asus P5N32-SLI, putting it on par with expected nForce4 performance.

Gigabyte has certainly pulled off an engineering feat, however a lot of flexibility has been sacrificed in the process. While the performance is good, until NVIDIA releases those all so precious 90.xx drivers this remains a board-in-potential. For now, you're better off with a normal nForce4 SLI board.

SiSoft Sandra 2005 Memory Bandwidth Test





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# Dell 2405FPW 24" TFT

Craig Simms eyeballs the greatest LCD known to man.

Price \$1799

Supplier Dell

Website [www.dell.com.au](http://www.dell.com.au)

Specifications 24in; 16ms response time; 1920x1200 resolution; inputs: component, composite, DVI-D, VGA, S-Video; 1000:1 contrast ratio; 89° horizontal and vertical viewing angle; Samsung LTM240M1 panel; 4-port USB 2.0 hub; Picture-in-Picture.

Giving one more inch and coming in between \$200-400 less than competing screens, the Dell 2405FPW is a monster, with plenty of desktop real estate to burn. Weighing in at a mighty 1920x1200 native res, the hugeness of this screen takes a while to adjust to and you'll find yourself having to actually turn your head to be able to take in its glory. After a small adjustment period though, there's no turning back – this thing was made for geeks. The contrast ratio sits at a hefty 1000:1 – twice that of its BenQ counterpart – making the whites whiter than ever before, perhaps even a little too bright by default. Despite this, there is no noticeable light bleed through at the back or the sides of the frame.

The frame is minimalist, with six buttons situated at the bottom right – power, two adjustment buttons, menu, a Picture-in-Picture (PIP)/Picture-by-Picture (PBP) selector and an input selector. Other funky features include a 4-port USB 2.0 hub (two on the bottom, two on the side), and a 9-in-1 card reader for those who are into their digital photography.

The panel is connected to the stand via a standard VESA mount, meaning that it can be attached to third party wall mounts or stands if you're that way inclined. The bezel can also be twisted left and right, but more impressively it can also rotate clockwise for vertical monitor goodness – perfect for design layout or MAME vertical gaming love. Input is where it's at though, and this beast takes it all – DVI, 15-pin D-Sub, S-Video, Component and Composite – and



dell 2405fpw display

allows for PIP/PBP functionality across all combinations, except DVI/D-Sub. This is convergent media at its best. Sadly though if hooked up through the DVI port, most of the OSD adjustments become disabled, leaving only brightness and colour levels – the rest needing to be tweaked through your video card control panel.

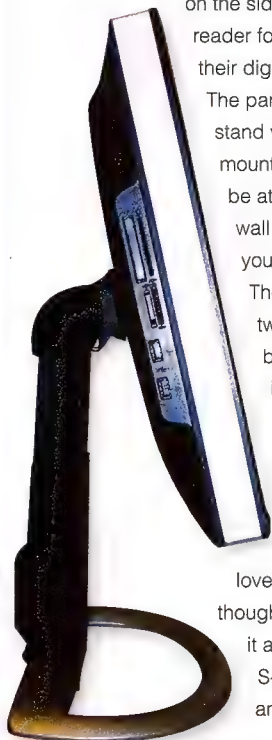
Caning the DisplayMate tests, the 2405FPW allowed us to easily differentiate the full 256 grey levels, with colour gradient results and black levels being equally impressive. For desktop use, text is sharp and highly readable – Dell certainly haven't shirked from bringing an amazing amount of clarity to the table with this display.

The shortcomings of DVD (namely the comparably low resolution) are apparent on this monitor – you really need to play HDTV to fully appreciate it – and appreciate it we did, in full 1080i glory. Both slow and fast action scenes were displayed wonderfully and the Atomic Labs were overwhelmed with the rather girlish sounds of ooh-ing, aah-ing and gushing at the non-existent ghosting, the sharp images and the absolutely superb colour reproduction.

'But what about the sodding games?' we hear you all scream. Well it's all good news – with both Far Cry and Doom 3 showing little to no ghosting, the 16ms response time performs significantly better than the specs claim, and RPG/RTS nuts will drool all over themselves. There's also no need to worry if you don't have the video card grunt to run games at the monitor's native res – the panel is capable of three scaling modes – fill, aspect ratio or a straight 1:1 – effectively turning off the pixels that aren't required, and eliminating unsightly scaling smudge.

The dead pixel policy is decent, with six or more defunct or stuck pixels constituting a possible claim for replacement – however you have Dell's 15-day no questions asked return policy to fall back on as well, should the screen arrive with faults out of the box.

The Dell 2405FPW is a must-have for those who can afford it – no doubt about it, this sucker is going straight into the Extreme Kitlog.







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WWW.COOLERMASTER.COM



# Seagate Barracuda 7200.9 500GB

**Price \$587**  
**Supplier Seagate**  
**Website [www.seagate.com](http://www.seagate.com)**  
**Specifications 500GB, 7200RPM,**  
**16MB cache, NCQ, SATA II**  
**interface, 5 year warranty**

It's raining magnetic media here at the moment, for we received not one but two of the first half-terabyte drives to enter the market this month with the Seagate Barracuda 7200.9 and Hitachi Deskstar 7K500.

In the past we've seen great results from Seagate's Barracuda 7200 line with the 7200.7 and 7200.8, so we had high expectations for this latest revision.

To bring in this meaty half-terabyte storage the Barracuda 7200.9 utilises four 125GB platters. There are down-sides to packing so much density into the one drive – for one, the 7200.9 got very hot during testing, and it was noticeably louder for seeks than its predecessor. That said, the benefits are clear: in SiSoft Sandra, the drive pushed a pleasing 53MB/s overall, with a sequential read speed of 60MB/s and random read speed of 42MB/s. In HDTach it scored a respectable 13.8ms

access time and a burst rate of 247MB/s. It's good, but perhaps not good enough compared to the Hitachi 7K500 covered below.

Like others in the high-density Barracuda range, the 500GB model comes with 16MB cache, support for 3GB/s SATA II, and of course NCQ in addition to the 7200RPM spindle speed.

While not the fastest drive on the planet, it is one of the biggest and for the price a bargain if space has become a premium for you. Packing 500GB into a single drive you only need two of these babies and you have a terabyte RAID. And just what would you do with all that space?

Bill the designer, always ready to offer a helping hand, suggests it could always be used for storing your mass of midget pr0n. Certainly, that's the first thing that occurred to us.

AM

**score 8.0**  
OUT OF 10



seagate barracuda 7200.9

# Hitachi Deskstar 7K500 500GB

**Price \$572**  
**Supplier Hitachi**  
**Website [www.hitachigst.com](http://www.hitachigst.com)**  
**Specifications 500GB, 7200RPM,**  
**16MB cache, NCQ, SATA II**  
**interface, 3 year Warranty**

Ever since Hitachi bought IBM's hard drive division we've been waiting for something special from Hitachi, and the Deskstar 7K500 is a special kind of specialness.

Like the Seagate Barracuda 7200.9 above, the Hitachi Deskstar 7K500 sports a 7200RPM, 16MB of cache, NCQ and full support of the SATA II specification – except, annoyingly, the drive ships in standard SATA mode. In order to get the benefits of 3GB/s bandwidth with SATA II, a DOS based 'feature tool' program needs to be booted (off floppy) and navigated. Ostensibly this is to enable proper operation

on the majority of SATA controllers on the market, but for those of us who have long since ditched our floppies it's a pain in the bum. Fortunately though, a 2MB ISO image of the same program can be

downloaded from Hitachi's website and burned to CD.

Looking past this the performance of the Deskstar 7K500 is top notch. Starting with Sandra the 7K500 pulled in a steady 55MB/s overall with a sequential read speed of 62MB/s and random read speed of 45MB/s. HDTach revealed a swift 12.7ms access time and a burst speed of 224MB/s. In all but this burst speed, the Deskstar 7K500 outperforms the Barracuda 7200.9 covered above. Further impressing us, the 7K500 was noticeably silent with its seeks compared to the Barracuda 7200.9, making it a viable option for silent PC fanatics. Both drives,

however, get very hot so good ventilation is recommended.

Beating out the Barracuda 7200.9 in both performance and price, the Deskstar 7K500 is an excellent addition to your PC if speed and volume are your goal.

AM

**score 9.0**  
OUT OF 10



hitachi deskstar 7k500





# Gigabyte SilentPipe II 6600GT

**Price** 128MB \$259; 256MB \$279  
**Supplier** Gigabyte  
**Website** [www.gigabyte.com.tw](http://www.gigabyte.com.tw)  
**Specifications** NVIDIA GeForce 6600GT; 256MB GDDR3, 128-bit memory bus; PCB form ATX; PCI-E 16x.

God bless Media PCs. Sure, only 0.3% of the Australian population actually uses them, but they've led to a revolution in hardware design – the quest for silence. It turns out that people who watch movies on their PCs aren't the only ones who appreciate a bit of quiet time, as gamers also prefer the lack of high speed buzzing sounds. The Gigabyte SilentPipe II 6600GT is the latest bit of kit designed with those with an aversion to dBs in mind, as you might have guessed from its name.

As far as the silicon goes, it's a pretty stock-standard GeForce 6600GT. In other words, it'll be fine for a bit of Counter-Strike, but if you fire up Battlefield 2 it's going to struggle. At standard clock speeds, when tested on an Athlon 64 3500+ and 1GB of DDR400 memory, it managed to 3395 in 3DMark05 at 1024 x 768, dropping to a rather average 2644 when the resolution was cranked to 1280 x 1024.

High resolution, anti-aliased gaming is therefore not this card's forte.

But it's really designed for the home theatre PC in mind, thanks to the rather chunky copper and aluminium heatpipe assembly, which is totally passive. Totally passive equals totally silent, but it also makes for a large video card, taking up a total of two slots. The cooler gets quite warm under normal usage, but not so hot that it doubles as an impromptu BBQ. One downside of this cooling is that it makes overclocking a bit of a high temperature stretch for this card, peaking out at 545MHz for the core (up from 500MHz) and 1.1GHz for the memory (up from 1GHz). At these speeds it returned 3739 at



1024 x 768 and 2945 at 1280 x 1024 in 3DMark05

– a small improvement but nothing to write home to Bubba about.

The fancy heatpipe cooler also comes at a cost, with the 256MB version of this card emptying your account to the tune of \$279. Having said that, what price is silence worth to you – provided you can squeeze this double slot card into your inevitably minuscule home theatre PC?

BR



# CoolerMaster CM Ammo 533

**Price** \$100  
**Supplier** CoolerMaster  
**Website** [www.coolermaster.com](http://www.coolermaster.com)  
**Specifications** Dimensions (HxWxD): 485mm x 215mm x 460mm

Looking for all the world like something out of *Alien*, the CoolerMaster Ammo 533 mid tower hefts into this month's Labs at 10kg. The militaristic styling may not be to everyone's taste – however it fits its purpose perfectly as a rig to impress at LANs. Contributing to this image is the large moulded rubber handle, attached at the top via nylon straps and Allen-keyed screws and the large plastic-covered power and reset buttons mounted on top of the case in red and blue. We only wish these had been flanged out into gigantic stopper buttons that could be mashed with your fist during times of frustration, or to make a big scene as your machine powers up and the lights down the street dim.

While the removable fascia is a mixture of plastic and aluminium, the rest of the case is rolled steel. CoolerMaster has focused on screwless access, with thumbscrews used to enter the case, quick release catches for your expansion cards and quick secure plastic brackets used for

the 5.25in and 3.5in external bays. Unfortunately these are a pain to use thanks to the amount of force required to push the bracket into place. Similarly, regular optical and floppy drives are a hassle to insert into their racks due to extremely tight fits. While both of these will no doubt become easier with age and use, we can't help but feel a better solution is needed. Conversely hard drives were a pleasure to insert, with two brackets needing to be attached to the drive before entering it into the tray – simply clip them on, slide it in, and you're done. Sadly there's no removable motherboard tray.

Two USB ports and one port each for FireWire, headphones and microphone adorn the front right hand side, allowing easy access. For ventilation, everything that looks like mesh is just that, and a 120mm blue LED fan is mounted in front of the undersized three-drive HDD bay, providing much needed cooling. There is also a space under the PSU for another 120mm, should you chose to mount one.

Overall a decent effort from CoolerMaster, and mean enough looking to represent our beast box machine for Matchbox (see page 111).



CS



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# PowerColor X800GT EVO

**Price** \$399  
**Supplier** AustraliaIT  
**Website** [www.australiait.com.au](http://www.australiait.com.au)  
**Specifications** PCI-E 16x, 2xDVI-I & S-Video outputs, copper water block & radiator, adjustable fan 1700-3000RPM

**F**orgive us for being a little sceptical, but what's the point in sticking a big-arsed water cooling kit on to a mid-level video card? Wouldn't be better spending the money from the water kit on a higher grade video card, which would ultimately give you far superior performance at the same price? This must have missed the marketroids, because this nifty idea is applied to just a humble X800GT. We can understand why you'd strap a water cooler to a high end card like a 7800GTX, but an X800GT?

As well as a standard X800GT video card, this kit arrives with a pre-built water cooling card from Thermaltake, the Tide Water, which will fill another PCI slot, and only cools the GPU and not the 1.6ns GDDR3 memory. This chunky contraption incorporates a small radiator, reservoir, pump and fan. The fan can be run at two speeds, with the higher being unpalatably loud. It's easy enough to set up, but that's about

the only nice thing we can say about this card.

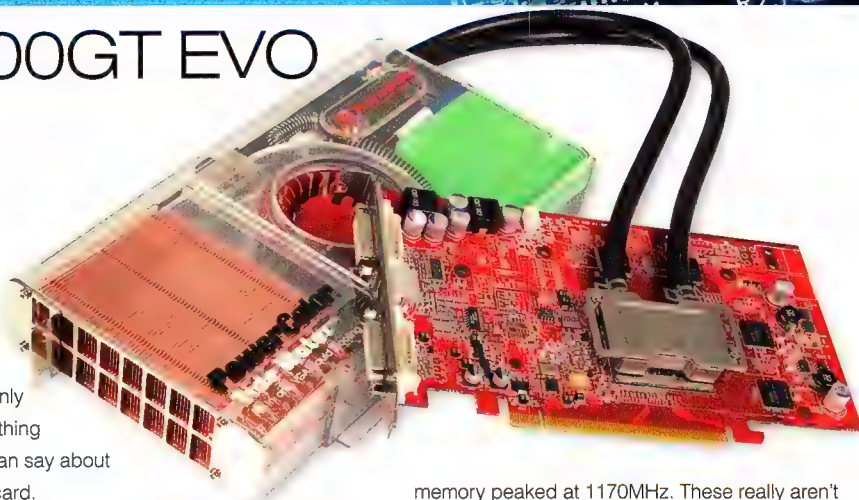
With the R480 core lightly overclocked out of the box at 500MHz and the memory putting along at 1050MHz at default speeds, this card isn't a spectacular performer, giving 4125 3DMarks at 1024x768 and 3213 3DMarks at 1280x1024 in 3DMark05 (run on an Athlon 64 3500+ with 1GB of DDR400 memory). Nothing that would inspire us to shell out 400 big ones for it, that's for sure. Our last shred of hope for the card was the overclocking results. Surely all this water cooling would help to kick it into overdrive, right? Wrong. We managed a stable overclock of 540MHz out of the core, while the

memory peaked at 1170MHz. These really aren't impressive when compared to the overclocks that are possible from simple air cooling.

If you want to be a water-powered show pony, pick up this overpriced gimmick. But if you've got half a brain in that noggin of yours, go for something like a 6800GT at the same price, with better performance to boot.

BR

**score** 5.0  
OUT OF 10



# Gigabyte K8N51PVMT-9

**Price** \$159  
**Supplier** Gigabyte  
**Website** [www.gigabyte.com.au](http://www.gigabyte.com.au)  
**Specifications** Socket 939; X2 compatible; GeForce 6150 GPU; nForce 430 MCP; PCI Express (x16, x1); 2x PCI, 4x DDR400/333 DIMMs.

**T**his Athlon 64 Socket 939 motherboard is of interest thanks to Gigabyte's claims that it's the first motherboard to ship with integrated high definition video. This capability is delivered courtesy of the GeForce 6150 chipset, yet we're pretty damn sure that integrated graphics have been offering resolutions over and above 1280x720 for several years.

One of this chipset's major claims to fame is its incorporation of Shader Model 3.0 support, but it'd want to be pretty bloody zippy to be able to run a game based around this. Sadly, as our benchmarks show, the integrated video is pathetically slow, which is not surprising considering its integrated nature. 557 in 3DMark05 at 1024x768 doesn't inspire confidence that this graphics chipset will be good for anything other than 3D Tic Tac Toe. However, if you're just looking for

integrated graphics that can handle DVD and HDTV duties, perhaps for a Media Center PC, then the 6150 will do a fine job. It's even got TV-out, enabling you to jack it straight into the back of your idiot box without any problems.

In terms of connectivity, this board offers a nice range of options for your pluggy bits. Eight USB 2.0 ports will have you downloading to iPods all day, while the four 3GB/s SATA ports are happy to run in RAID 0, 1, 0+1 and 5 modes. The four DDR400/333 memory slots offer plenty of potential for future memory upgrades when the 64-bit version of Windows 64 becomes a serious contender. Gigabit Ethernet is standard, while PCI Express (an x16 and x1) takes care of your video card needs. The performance of the memory bus is up to snuff, reaching ~4610MB/s in SiSoft Sandra's memory bandwidth benchmark for both buffered integer and floating point operations.



While the onboard video just doesn't cut it for anybody looking at some serious gaming, overall this isn't a bad board for those looking for a cheap and simple Media Center backbone.

BR

**score** 7.5  
OUT OF 10



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# Thermaltake Symphony

thermaltake symphony

**Price \$449**  
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**Website [www.anyware.com.au](http://www.anyware.com.au)**  
**Specifications Pure copper waterblock; dual pump with 90L/hr flow rate; five 1400rpm ultra-quiet 120mm fans (16dB).**

And the award for most ridiculously oversized packaging goes to... the Thermaltake Symphony water cooler! This towering monster takes the cake for being one of the largest components we've seen this side of a server rack, but if you have the room for it you'll be pleasantly surprised by its excellent performance.

It's obvious that Thermaltake has learnt a lot from the lessons of the past. Where it had previously set the benchmark for pathetically average performance with its early attempts at water cooling, the same can not be said of the Symphony. But before we kick in to its performance results, it's probably best to take a look at what arrives packed within the toddler-crushing pile of cardboard and polystyrene foam.

The kit is comprised of two main components -- the cooling tower, which incorporates the reservoir (pre-filled no less), pump, radiator and four cooling fans, and the all-copper

waterblock. The waterblock is so well polished that your moderately-hot girlfriend will be able to admire herself in it, and it fits on four different CPU socket types. Mounting it to your chosen mobo is simplicity itself thanks to the well-illustrated manual, whose many photos will help you overcome its bad case of English.

An excellent connection system makes hooking up the waterblock to the radiator tower a breeze, and we're confident that this isn't the kind of system where leaks might be an issue. Speaking of the radiator tower, it's bloody massive. Almost four-foot massive to be precise, but it's modelled to look like a large speaker system. Even though the four fans within spin at a low rpm, it's the teensiest bit noisy compared to other systems, but the performance can't be faulted.

Our CPU peaked out at 35°C under load on an Athlon 64 3500+, much cooler than the 47°C or so we're used to from a high-performance, high-noise air cooled heatsink/fan combo. This result alone makes the Symphony worthy of consideration for H<sub>2</sub>O aficionados, and the asking price of \$449 isn't too unreasonable for such a high quality, easy to use kit. Just be careful when installing this in gaming dens with low ceilings.

BR



**score 8.0**  
OUT OF 10

# ViewSonic N2750w

viewsonic n2750w

**Price \$1789**  
**Supplier ViewSonic**  
**Website [www.viewsonic.com.au](http://www.viewsonic.com.au)**  
**Specifications 27in viewing area; 1280 x 720 resolution; 16ms pixel response time; 50,000-hour lifetime; 3-year warranty (1 year for panel).**

With the Xbox 360 just around the corner (and featured in this very issue!), it's a sure bet that many Atomicians are sleeping on a secret stash of cash, growing daily in preparation for a shiny new high definition display device. At a credit card-friendly \$1789, ViewSonic's N2750w is one of the most affordable screens to fit the bill, but what can you expect from such a cheap HD display?

With a diagonal viewing area of 27in, it's not going to put any 50in Sony behemoths to shame, but if you're moving from a 68cm TV you'll only need to squint a little bit more. With a native resolution of 1280 x 720 and a pixel response time of 16ms, it's great for big screen gaming from the PC, although ghosting is noticeable if you're accustomed to a hyperactive 8ms display. Unfortunately this display refused to work with our HDTV set-top box, the Digitec DG5000i. It worked fine via a composite connection, but

using component resulted in a garbled mess. Strangely our progressive scan-modded Xbox worked fine with component, so we're guessing it's a compatibility issue between the set top box and the display. The internal TV tuner isn't worth talking about -- reception was very distorted, and as far as we can tell it doesn't offer the HD resolutions necessary to make the most of the screen's capabilities.

When plugged into a PC via the VGA input the image is hard to fault for a display of this size. It can't compete with a smaller 19in LCD screen, especially in regards to the uniformity of the backlighting, but it's a ripper for gaming. Call of Duty 2 has never looked so good, even with a dead pixel to the left of the screen. We're sure this display will look a treat when feeding on a 360's output and it offers the same high contrast and rich colours that LCD users have grown to love.

While it's by no means perfect, this display is



all about offering a large, high resolution display at a low resolution price. And in this regard the N2750w does well.

BR

**score 7.0**  
OUT OF 10



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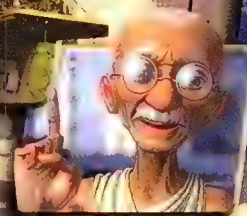
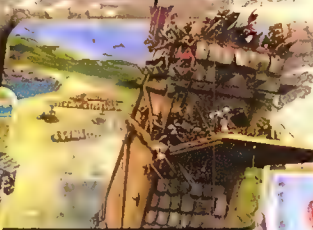
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# kitlog

Got gear? Use our kitlog matrix to find the best upgrades for your needs.

There's nothing sexier than new kit. And if you're in the market to buy, you don't want to waste your hard earned cash. Let *Atomic* advise

you, with our new section for recommended kit! All of these products have been reviewed in *Atomic*. To make it easy we've created a matrix of categories

for you to cross reference, so if you're buying for yourself (*Extreme*) or your hardcore granny (*Budget*), you know where to spend your cash.

## CPU's

## Coolers

## Motherboards

## Video cards

### BUDGET



#### AMD Athlon 64 3200+

RRP \$290

It's been around for some time, yet still remains one of the top performers for the money. Well worth a 'budget' look.

Reviewed in Issue 53 – Page 70



#### Thermalright Golden Orb II

RRP \$49

For such a large and effective heatsink the price is hard to beat. It's low profile too, so should fit in all sorts of cases.

Reviewed in Issue 58 – Page 33

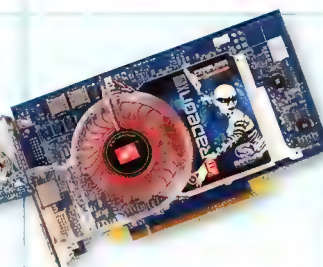


#### Gigabyte GA-K8VT890-9

RRP \$139

Sporting VIA's K8T890 chipset, this Socket 939 board is perfect for the low budget while still packing a powerful punch.

Reviewed in Issue 54 – Page 55



#### Sapphire X800GTO Fireblade

RRP \$280

The Sapphire X800GTO RADEON Fireblade is a power packed performance beastie.

Reviewed in Issue 59 – Page 35

### PERFORMANCE

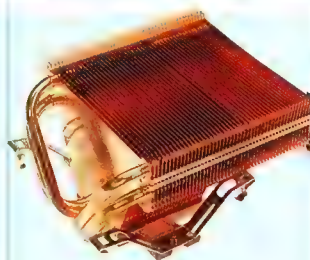


#### AMD Athlon 64 X2 4800+

RRP \$1400

Not quite as fast as an FX single core, but the 4800+ has two CPUs for your multitaskin' lovin', for the ultimate in gaming + desktop use.

Reviewed in Issue 58 – Page 35

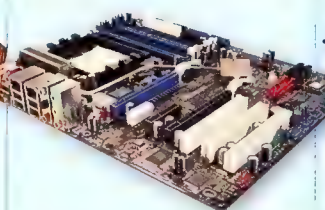


#### Thermalright XP-90C

RRP \$99

Thermalright built their business around effective coolers, and the XP-90C is one of the best money can buy. It looks secks too!

Reviewed in Issue 58 – Page 33

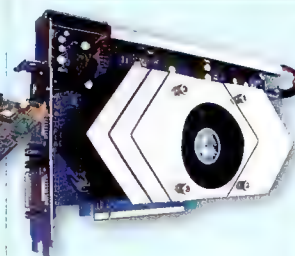


#### ASUS A8N-SLI Premium

RRP \$320

If stability and performance are important, the A8N-SLI Premium is simply one of the best boards moolah can buy.

Reviewed in Issue 56 – Page 41



#### ASUS N7800GT DUAL

RRP \$1499

Yegads this card is *massive*, and so is its performance. You may now repeatedly spank the monkey.

Reviewed in Issue 59 – Page 41

### EXTREME



#### Intel Pentium 4 3.73GHz Extreme Ed

RRP \$1590

When raw MHz and boasting rights count, the P4 3.73 GHz EE is your man – er, processor.

Reviewed in Issue 54 – Page 54



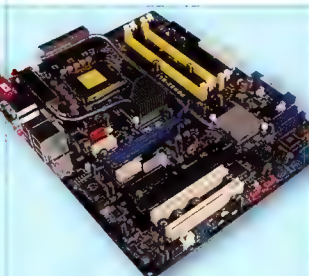
NEW ENTRY

#### Thermalright Symphony

RRP \$449

Yegads. Towering at 1.1m tall, this beastie will have peers ogling in jealousy. It's complete overkill – and we love it.

Reviewed in Issue 60 – Page 52



#### ASUS P5N32-SLI DELUXE

RRP \$399

It doesn't get better than NVIDIA's new SLI x16 platform and dual-heat-pipe cooling for the Pentium.

Reviewed in Issue 59 – Page 45



#### Leadtek 7800 GTX TDH EXTREME SLI

RRP \$995 x2

There's so much beef in two of these you could open your own market selling, like, beef. Or noodles. Yum.

Reviewed in Issue 59 – Page 46



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## Hard drives



### Maxtor MaxLine III 300GB

RRP \$259

These 300GB drives are fast and sweet, and yet the price is just right, nigh on a dollar per GB.

Reviewed in Issue 57 – Page 31

## Monitors



### BenQ FP71V+

RRP \$599

This 5ms 17in LCD is cheap and speedy, and plenty good enough for even the most fussy of grandmas. Send her your love today!

Reviewed in Issue 54 – Page 48

## Speakers



### KOSS SB40

RRP \$129

You'll find that these circumaural boomers will do you justice just fine if you can't afford a THX 7.1 platinum plated surround sound setup.

Reviewed in Issue 38 – Page 30

## Cases



### Coolermaster Ammo 533

RRP \$100

Perfect for LANs with its heavy duty handle, military styling and rugged construction, the Ammo blasts the budget competition away.

Reviewed in Issue 60 – Page 50



### Hitachi Deskstar 7K500

RRP \$572

With the 'Deathstar' spectre long faded, Hitachi's 500GB super quiet SATA II drive with 16MB cache impressed us greatly. Hugely, in fact.

Reviewed in Issue 60 – Page 49



### ViewSonic VX924

RRP \$899

This 19in monitor screams along at 4ms and is our monitor of choice. Fantastic image quality, features and speed. Winner.

Reviewed in Issue 54 – Page 48

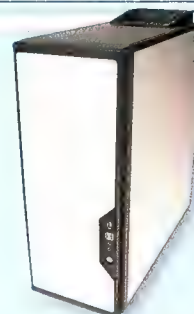


### Altec Lansing MX5021

RRP \$349

This 2.1 set is for those after a decent yet simple setup. The best 2.1 speaker set money can buy, and the next best thing before 5.1.

Reviewed in Issue 47 – Page 85



### Antec P180

RRP \$265

For functionality, style, and silence you can't go past Antec's sleek P180. With some of the coolest features to ever debut in a case, the P180 is the shiz.

Reviewed in Issue 56 – Page 39



### Western Digital Raptor WD740GD

RRP \$285

It may be small for the size but it's the fastest SATA drive money can buy. RAID two and you're sitting pretty!

Reviewed in Issue 57 – Page 31



### Dell 2405FPW

RRP \$1799

24in of multimedia joy. The Dell made us cry at its amazing pricepoint, and thorough domination of DisplayMate. Finally, inches you can lust for.

Reviewed in Issue 60 – Page 47

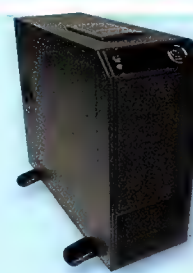


### Logitech Z- 5500 Digital

RRP \$749

Able to play the 'liquid gold' sound that is DTS 96KHz/24-bit, this 5.1 beast can wreck both home and hearing alike with equal impunity.

Reviewed in Issue 48 – Page 56



### Nextherm ICS 8200

RRP \$470

Packing a peltier with an LCD temperature readout, you can't go past a case this cool (literally) case and not want to kiss it all over.

Reviewed in Issue 54 – Page 50



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# THE JOY OF

**James Wang gets intimate with Microsoft's new pride and joy, and answers all the important questions about what it can do and where it's going to take us.**

**T**here are many reasons why the Xbox 360 might have been better titled the 'Xbox 180'. Whereas the first Xbox was big, bulky and black, its successor is slim, sleek and silky white. While the design has certainly been a U-turn, it's surprising to note that the hardware has followed a similar trend. Unlike the original Xbox which used off the shelf PC components, the 360's hardware is fully proprietary. The CPU is custom designed by IBM, while the GPU is built from the ground up by ATI and represents perhaps the most ambitious graphics architecture ever conceived. But most importantly, whereas the first Xbox was a clumsy effort by Microsoft to jam its feet into the rapidly closing door of home entertainment, the Xbox 360 kicks that door right open.

As with every other big console development, Atomic is here to give you the low-down on the tech. In the past we've made it a habit to lift the lid and goggle over the goodies inside, but with just six Xbox 360s in the country at the time of writing, and all of them slated to be on show at Atomic Live 2005, we had to restrain ourselves. We contemplated pulling one apart *anyway* and just handing it back to Microsoft all sticky-taped together, but the idea of depriving loyal Atomicians at the show of the opportunity to play on one of these new machines didn't appeal in the end. We love you guys too much :)

## WEAPON OF CHOICE

The sole purpose of the first Xbox was to provide Microsoft with a beachhead in the console arena. It wasn't about raising gaming to the next level or dethroning Sony. It wasn't even about making money – to this day Microsoft bleeds for every Xbox that is sold. Xbox was about legitimising Microsoft's position in the living room. Not only did it manage to achieve this, but Microsoft became a respected leader in the home console market. The console established Xbox Live, the well thought out subscription based online gaming service. It helped Microsoft beef up its games division, both internally and by acquiring third party game studios. But most of all, it set Microsoft up for the next generation – the Xbox 360.

The Xbox 360 is well and truly a next generation console. It certainly is not 'Xbox 1.5', as Sony would have you believe. The system innovates in every respect, from the controller to the system architecture to the online experience. Microsoft has paid immense attention to detail, the result of which ironically bears the refinement of an Apple product. Indeed Microsoft has developed the Xbox 360 in a very Apple centric way – designing everything from the hardware and the software to the online services and packaging. It is finally delivering a whole product experience rather than just a shrink-wrapped CD.

There are two pieces of technology in the Xbox 360 system that stand out as unprecedented. The first, surprisingly, is its software interface. A touch of a button brings up a 'blade' style dashboard that not only allows instant access to games, media and settings but is also robust enough to allow you to browse other PCs and online content. Prior to seeing the 360, we considered such unified interfaces as essentially unusable. But the Xbox 360 interface has proven all our doubts unfounded. We grasped it in a few minutes and it truly does all that it claims. Watching a video stored on a nearby computer wirelessly, playing arcade games stored on the hard disk and checking gaming status online was all simple. If the term weren't so abused, it would be fair to call the Xbox 360 the 'home entertainment hub'.







The other unique piece of technology is the heart of the machine itself. No, not the CPU. Dubbed 'Xenos', the ATI designed GPU is the real centrepiece of the 360. So without further ado let's delve into each component of the Xbox 360 hardware, and why it's such a revolutionary step.

## THE SYSTEM

The Xbox 360 is powered by an IBM designed PowerPC CPU called 'Xenon' and an ATI designed GPU called 'Xenos'. Both chips are manufactured on the 90nm process and employ 165M and 337M transistors respectively. The Xenos also takes on the functionality of the north bridge, linking the CPU and south bridge to system memory.

A moderate 512MB of GDDR3 memory is shared by CPU and GPU. Clocked at 700MHz, this provides 22.4GB/s of memory bandwidth. The south bridge connects to various input and output ports as well as a 12x DVD drive. Next generation optical format such as HD-DVD may be supported in future revisions.

## XENON

The Xenon CPU is based on the popular PowerPC architecture. Created by Apple, IBM and Motorola in the early '90s, the PowerPC architecture has since been used extensively in Apple computers, performance workstations and embedded systems. Most remarkable of all, it powers all three next generation consoles – Sony's Playstation 3, Nintendo's Revolution, and of course the Xbox 360.

The Xenon processor has three identical cores clocked at 3.2GHz. Each core is dual-threaded, providing the system with six logical threads. A 1MB block of L2 cache is shared across the three cores.

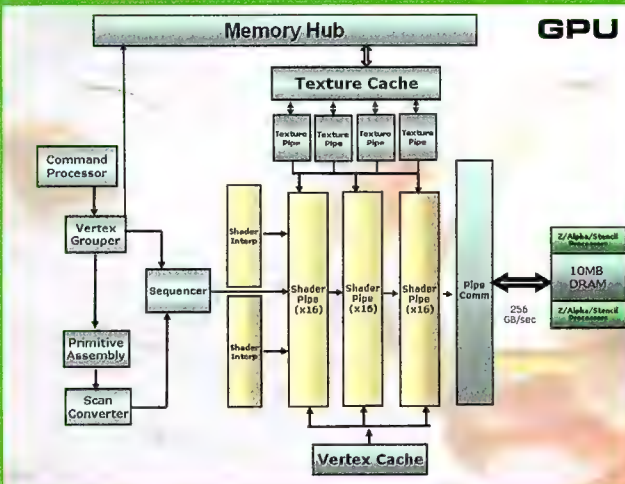
Tempting as it may be, a direct numerical comparison with a desktop CPU won't provide a telling story – the Xenon is designed with a different philosophy in mind. Each Xenon core is much simpler than what you'd find in a Pentium 4 or Athlon 64. In terms of transistor count, each core is a fraction of the complexity of a traditional core. This saving is achieved by discarding the hardware required for out of order execution. Out of order execution is a hardware feature that allows CPUs to re-schedule instructions on the fly to extract greater parallelism. While this helped boost single threaded performance in the past decade or so, one cannot extract increasing amounts of parallel code from a single instruction stream. Xenon does away with such hardware and hands the responsibility to the programmer. This way, the extra transistors can be spent on better floating-point hardware and additional cores.

While each core is greatly simplified as a result, they have also been greatly boosted for single-instruction multi-data (SIMD) performance. Each core has a VMX unit that can execute SIMD instructions over 128-bits of data. Each thread has its own set of 128 registers. When used in unison, the six SIMD threads can provide an enormous amount of floating point power. Microsoft envisions the SIMD units will do what it calls 'procedural synthesis', where art content is generated on the fly from abstract descriptions. While such techniques to generate textures have been around for some time, adoption has been low. It will be interesting to see if the Xbox 360 changes this.

Overall, the Xenon will not easily outperform a desktop CPU. In his QuakeCon 2005 keynote, John Carmack said that next generation console CPUs would have about half the performance of a high-end desktop CPU using current game code. A well-designed next generation engine will be needed to extract superior performance.

**The Xbox 360 system innovates in every aspect, from the controller to the system architecture to the online experience**





The Xbox 360 is a big departure from its predecessor, utilising a triple-core PowerPC processor and a special breed of ATI's X1000 core designed specifically for Microsoft. In fact, most of the hardware in the console is now Microsoft proprietary. How this will affect ports remains to be seen.





## CONTROLLERS

The new wireless controller closely resembles the Type-S controller from the original Xbox. The addition of a 'guide' button provides one touch access for turning the console on and off. A circular light around the guide button is divided into four quadrants. Pressing the sync button will see the light spin as it searches for the nearest Xbox to connect to. Once connected, both the console and the controller will have the same quadrant lit up. Very cool.

## HARD DRIVE AND BACKWARD COMPATIBILITY

A detachable hard drive provides 20GB of storage for saved games, media and backward compatibility. Only selected games will be backward compatible due to the complexities with CPU emulation. Halo and Halo 2 are supported, along with other titles listed on the Xbox 360 website. To play older games, an 'emulation profile' must be downloaded from either Xbox Live or a CD to the hard disk.



## CLOSING THOUGHTS

The Xbox 360 hits Australia on the 2nd of March 2006 with a RRP of \$499 for the basic system and \$649 for the premium bundle that includes a wireless controller, HDD and headset. While many are lamenting the three month wait before it arrives in Australia, it will be a much more refined system by March. By then, the reported overheating issues should be resolved and a much better line up of games will be available. Atomic, for one, will be keeping a close eye on its development and reviewing the games as soon as they enter the country.

## Graphics Comparison

	Clock speed	Transistors (Millions)	Vertex Shaders	Pixel Shaders	Texture Units	ROPs
Radeon X1800	626MHz	321	8	16	16	16
Geforce 7800 GTX	550MHz	302	8	24	24	16
Xenos	500MHz	337*	48 (Unified Shaders)		16	8

\* 232M for the GPU and 103M for the eDRAM chip

## System Comparison

	XBOX 360 (Xenon)	Playstation 3 (PS3)	Typical PC in 2006
CPU cores	3 PowerPC cores	1 PowerPC core and 7 SIMD cores	2 Pentium or Athlon based x86 cores
CPU Clock speed	3.2GHz	3.2GHz	3-4GHz
CPU threads	6	9	2-4
L1 cache	32kB	32kB	32kB
L2 cache	1MB	512kB	1MB
Peak 32-bit Floating Point Performance	96GFlops	211GFlops	Tens of GFlops
Total Memory	512MB GDDR3	256MB of XDR and 256MB of GDDR3	1GB
Bandwidth to main memory	22.4GB/s	25.6GB/s	<10GB/s
Bandwidth to video memory	22.4GB/s	22.4GB/s	22.4GB/s
GPU eDRAM Bandwidth	32GB/s	N/A	N/A
Cost	\$500-650	\$500-650	\$1000-2000





# GAMES

## PROJECT GOTHAM RACING 3

DEVELOPER: BIZARRE CREATIONS

When a new console is launched a hot driving game is essential as part of the launch line-up. PGR3 is that, but also showcases just what we can expect from the revamped Live service, and more.

As expected it looks a treat, although there is clearly no anti-aliasing running (or if there is it's the new kind that makes jaggies jaggier). The road textures are nicely done and the sensation of speed is real. As with all Xbox 360 games we've seen running there's no anisotropic filtering running, and at best it looks trilinear. That's most noticeable driving slowly – the road turns into a hazy blur only a car-length or so in front of you. Trackside, the buildings are better detailed than in any previous console game and on par with PC games. Pleasingly, there's no popup at all, no matter how far away a building is, it stays on screen. We were told that in early versions the building textures were razor sharp but that caused motion sickness, so now they've been deliberately blurred. We smell porky pies with that one.

The car interiors won't disappoint anyone. The tan leather Ferrari leather looks real and all the cockpit bits are there in good detail. You can look around while racing with one of the analogue sticks.

A very neat Live feature is Gotham TV, where championship races will be viewable by up to 30,000 people at a time. To drive – being the important bit – is frankly a thrill. Car handling feels very accurate and is pleasingly natural using the excellent control pad. The street tracks offer good variety and you'll be at this forever cranking out better lap times, so appealing is the game.

## KAMEO: ELEMENTS OF POWER

DEVELOPER: RARE

Launch titles are usually weak overall, but not Kameo. In development for six years, Rare had intended this to be a GameCube title, then an Xbox title after Microsoft bought the company for \$500 million. Then when it was 80 percent complete, they decided to make it a 360 game.

It looks dazzling. The textures and lighting are as good as the very best on PC. The scenery is rendered with exquisite detail, and dark gothic levels show off steel and stone surfaces that look wet and rusty. This is the game to show off to your mates when you grab your 360.

The premise has you as Kameo, an elfy being who can morph into one of ten creatures at pretty much anytime in the game. Each creature has certain skills and the trick is to be the right character at the right time to overcome the obstacles ahead. At times it feels like a big platform game, at others an RPG-lite. At all times it's clever and moreish and extremely beautiful to look at.

Rare has a thing for cutscenes, and Kameo's are incredible. One amazing moment comes as you're riding an old Clydesdale along a peaceful track, you come over a ridge to see thousands of orcs coming at you with swords drawn, you'll ride through them, scattering them in all directions until a minute later thousands of good orcs join in the fray. To ride through so many thousands of units all fighting to the death really shows what the 360 can do in the right hands.

As a hardware showpiece Kameo is a helluva launch title – it's got great graphics, immersive sound and brilliant gameplay. Just as you'd expect for \$500 million and six years work.



Project Gotham Racing 3



Project Gotham Racing 3

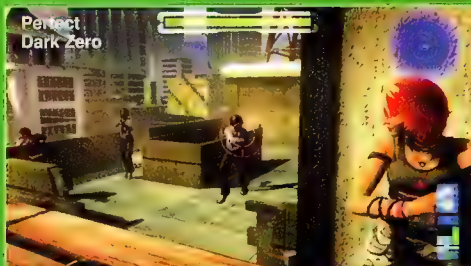


Kameo: Elements of Power



Kameo: Elements of Power





TOP LEFT: FIFA 2006 is still being worked on, yet already looks spectacular. BOTTOM LEFT: Joanna Dark takes cover behind a wall, getting ready to blow away some strange men who think bicycle helmets will stop a bullet. ABOVE: Kokoro gives Kasumi some serious cold shoulder in DOA4.

**Microsoft  
is finally  
delivering  
a whole  
product  
experience  
with the  
360, rather  
than just  
a shrink-  
wrapped CD**

## DEAD OR ALIVE 4

DEVELOPER: TEAM NINJA

The premier breast bouncing physics game is back, with fancy new graphics and sound to boot. Like the previous games in the series, the game is still far too short in normal difficulty and can be successfully defeated through a bout of experimental button mashing. However the multiplayer holds the true joy – allowing you to be as hardcore as you like, with the skill level required ramping with your opponent's thanks to the insane amount of moves and combos available. As dedicated Ninja Gaiden fans, we had to play this one through as Ryu Hayabusa – of course totally kicking arse in the process. Backgrounds are very lush as well as highly animated, and unlike the other games this one seemed to be running low level anti-aliasing. Crowds are entirely 3D and act independently, lighting and explosion effects impressive, and whenever a super move is performed motion blur kicks in for a spectacular display. Despite being unfinished, this was certainly one of the more polished titles on display.

## PERFECT DARK ZERO

DEVELOPER: RARE

If you've played Golden Eye, the original Perfect Dark, or pretty much any decent console FPS over the last eight years, you'll know what to expect here. Well, plus pretty lighting, particles, bump mapping and reflection effects. The game takes place historically before the Nintendo 64 title (hence the Zero), with the level we played providing a high action romp across city rooftops, including flying-fox style traversing between buildings. You can take cover behind almost anything, as well as army roll – both moves forcing the camera into third person mode, then back again once the maneuver is finished. While taking cover, your crosshair can be lined up on anyone around the corner, allowing you to step out for a few choice shots, then return to the safety of your wall or crate. Despite the high action, we couldn't help but be disappointed with the bland textures and character models – however the version we played wasn't the final version of the game. Despite this, there's no doubt this is going to be the Live game of choice for quite some time – at least until the Halo 3 release.

## FIFA 2006: ROAD TO THE WORLD CUP

DEVELOPER: EA SPORTS

Although we only saw a very early alpha version of the game, FIFA 2006 is shaping up to be very nice indeed. It's got amazingly detailed facial models, and it's clear that an incredible amount of time has been spent on making the match seem more like TV coverage than an actual video game, thanks to the sweeping camera angles and depth of field effects. Getting a red card has never been so exciting before.



## XBOX 360 FACTOIDS

Facts and figures straight from our experience with the new console.

### ACCESSORIES

- The remote bundled with the Premium pack is smaller than the aftermarket remote, which features channel and volume buttons on the bottom.

### INTEROPERABILITY

- The Xbox 360 links perfectly with a Windows Media Centre server, allowing streaming of movies, TV and music. Several Xbox 360s can be hooked up to a single server.
- You can play your own music during gameplay, from any device – including the PSP. Simply press the guide button (the big silver thing) to bring up the option.
- You can still system link. Xbox 360s will happily play against original Xbox owners, so long as they're both running the original Xbox game.

### THE CONTROLLER

- The guide button can be pressed to bring up a menu that enters from the left which displays your game card (profile), as well the option to reset to dashboard.
- The range of the wireless controller is quite large, as demonstrated at least as much as 10 metres away through our tests while still having perfect control the entire time.
- The wireless controller can be powered by AAs or a rechargeable battery.

### XBOX LIVE

- New 'achievements' system. As you complete games or satisfy certain objectives you will be granted an 'achievement'. This is also a good way to see how much of the game you've completed.
- Anyone can view your achievements online, as the profile you set up on your Xbox 360 is linked to the Xbox forums. Details should update in less than five minutes. This link to the forums is quite powerful – you can view what people are currently playing, what they've played in the past and how many achievements they've earned. You can also set up a profile on the Xbox forums and transfer that to your Xbox 360. If you're fickle you can change your 'gamer tag' (just call it a 'nickname' Microsoft!), for a price.
- Attached to your profile is also a 'rep' rating, out of five stars. The better people receive you in Xbox live games, the better your

reputation is, with the starting point set at three stars. This is managed through a player review system, where you can rank people based on whether they trash talk, use bad language, are disruptive, aggressive, unsportsmanlike or if they quit the game early. You can then see if the people you're playing against are the sorts of people you'd like to play with regularly. Xbox live will attempt to connect you to a game with the best gaming experience, which means people with bad reps get lower priority.

Avatars are now in Xbox live, and you will be able to buy avatars in the future. Nice.

'Microsoft Points' is the Xbox live currency, and are bought. Scarily for impulsive buyers, after you hand over your credit card number, you can add points simply by hitting a button on the Xbox controller – everything else is done for you. Much like mobile phones, pre-paid cards are also planned.

There are four playing zones at the moment – Pro, Family, Recreation and Underground. Underground is where you can expect all the swearing and abusive players to end up, as a sort of "anything goes" area. Choose your preferred zone and you'll be matched with similar players.

Classic Arcade games including Robotron, Smash TV and Gauntlet are available, with an option to choose updated or original graphics. There are plenty of options for casual gamers here, including more recent games such as Zuma and Mutant Storm. There are free versions of the arcade games, however you cannot gain 'achievements' on these.

Demos are free to download – although you'll need a hard drive for this, or it'll have to be under 64MB to fit on the memory card.

### THE CONSOLE

- New global preferences system – if the options exist in game, the console will set them up for you automatically based on genre. Never set inverse for your vertical view again in FPS, or permanently set your view to cockpit for racing games.
- Parents can lock out quite a lot to protect the kiddies. Firstly there's the ratings system, where the player can only access games below a certain classification. This classification is embedded on disc, and if it's not, then the rating defaults to MA15+. Other features that can be restricted are online friends, communications, gamer profiles, online status, online games, member content and downloadable content.
- No word on the possible HD-DVD upgrade just yet.



LEFT: The Xbox 360's interface uses a tabbed system called 'Blades' to navigate through features and options. RIGHT: The Xbox Live Marketplace grants access to a variety of online goodies including demos, trailers, themes, and the exclusive game downloads. How cool is that?





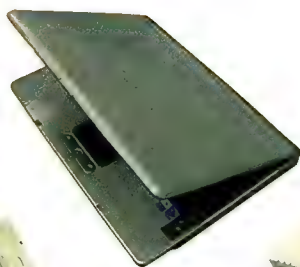
MOBILE  
TECHNOLOGY

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# technique

Hands-on tutorials, tips,  
and tweaking for the technically inclined.

this  
month



## ▲ Windows

**Craig Simms** reveals the secrets of the ultimate Windows XP install in this second installment.

74  
cylinders for this disk is set to 8000. If you're having trouble with that, but this is larger than the default. Certain setups cause problems with: Lilo, Grub, and other partitioning software from other OSs (e.g., old versions of Lilo, OS/2 FDISK).  
help):  
74.3 GB, 74355769344 bytes  
sectors/track, 9039 cylinders  
of 16065 \* 512 = 8225280 bytes

## ▲ Linux

Nothing is as sexy as a dual-boot, dual-RAID system, and **Ashton Mills** will show you how.



## ▲ Hardware

Think you're hardcore? **Ron Prouse** is, and he proves it by submersing an entire PC in liquid.

## tinytweaks

### Self-exe

You don't necessarily need NSIS, Installshield or WISE to create an install program – if you only have basic needs, then you can build one with WinRAR and similar archivers. When adding files to a new archive, check the 'Create SFX Archive' checkbox to create a .EXE instead of a .RAR file, for example. Go to the Advanced tab and click SFX Options. Here you can execute programs before and after the extraction, delete files, add shortcuts to the Start Menu or Desktop, choose whether you want any user interaction at all, add a readme, license file or custom icon and set how you want the installer to behave when it finds already existing files. You can extend abilities further by executing custom batch or command scripts from within the archive file – only your ingenuity is the limit!



### Make Js

If you compile your own programs, or you're a Gentoo user, you'll be familiar with **make** and the esoteric joys it brings. These include, of course, the **-j** flag to specify the maximum number of parallel makes to process. If you use a dual-core CPU, or **distcc**, don't assume the old wives tales of 'number of CPUs + 1' is the best value for **make -j**. While there are overheads, especially with **distcc**, each extra processor and the distribution of make threads between them generally allows for a greater number of parallel makes to reduce compile time. Too high a value is as detrimental as too low, of course, but don't take the CPUs + 1 wisdom as a given – use **time** to measure how long it takes to compile a program and find the sweet spot value for your CPU and **distcc** network. Remember to clear **ccache** and **sync** before each test!



### Bendy wendy

Bending acrylic sheet is simple enough using a heat gun, or even a hairdryer. The problem with this method is as the surface becomes soft and malleable it's harder to keep folds. The answer is to shield the areas that are not being bent from the heat, and the solution is just two short planks of wood! Place the planks on the surface of the acrylic, one on either side of the line that is being bent. Leave approximately 3X the thickness of the sheet as a gap and heat the exposed acrylic evenly. Once the acrylic is malleable, remove the heat and the planks and fold the sheet down evenly. On 'long' sections, use one of the planks to exert an even pressure over the length of the folded area. Hold the bent section in place until the temperature cools and the plastic returns to a rigid state.





## XPDite, Part 2

**Craig Simms** rounds the post on the ultimate Windows XP install guide.



Last month we used nLite and combined it with some handy packages to create an easy custom install for Windows XP – this month we'll look at customising that install further, as well as delving into the wonders of post installation scripts. Pure, geek fun.

### Bored of Bill

First up, let's make the Windows install process a little more pretty. Those annoying screens that tell you how wonderful and fast the Windows install is going to be, despite evidence to the contrary? Well they're called billboards, and you can change them. Point your browser towards [www.msfn.org/board/](http://www.msfn.org/board/)

[index.php?showtopic=50166](#) and download the latest version of WinntbbuED. Execute the file, go to File -> Open and point it towards the C:\XPCD\I386 folder that you created in the last tutorial, and it should find WINNTBBU.DLL. It will also ask if you want to expand syssetup.dll – say yes.

Your billboards should now have loaded, and you should be able to edit all the text fields directly simply by clicking on them. If you like, you can go to View -> Edit Fields to see which of the fields can actually be edited. To cycle through the available billboards, go to the Billboard OS menu, hover the mouse over the version of Windows you have and select the number you wish to edit.

If you wish to change the pictures, colours and fonts used, then the Edit menu is your friend – be careful though, you must use fonts already registered with Windows at that stage of the installation – so it's probably best to stick with Tahoma.

When you're done, you can go to Billboard OS -> Simulate to see your work, and if you're happy, save it.

### The Applicator

Things have gotten much easier in terms of post-installing applications since those heady cmdlines.txt days. The method is ultimately the same, however the interface has been made a whole lot more pleasing aesthetically. Grab RunOnceEx.cmd Creator from [runonceexcmd.sourceforge.net](http://runonceexcmd.sourceforge.net) and install it.

Run the program. You'll notice a checkbox titled 'Include CMDOW' – leave it checked! This will allow us to hide any Command windows generated during the install process, making it transparent to the end user. Note that to install programs transparently the installers you use will either have to have switches to install silently, or you will need specially created installers (check out [ryanvm.msfn.org](http://ryanvm.msfn.org) for some programs). You can usually find out if an installer has switches to install silently by running it from the Command Prompt with a '/?' argument.

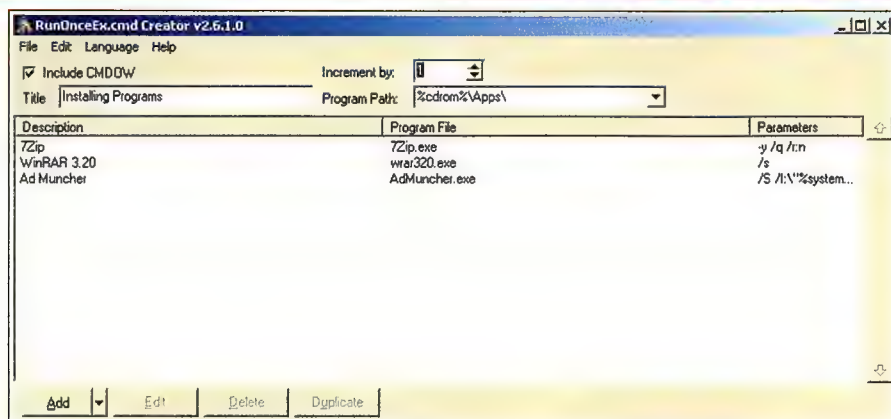
There are two ways to add files to the RunOnceEx.cmd Creator list – both accessible from the arrow down button next to the 'Add' button. Selecting Normal requires you to enter all details manually, however selecting Database gives you access to a drop down list of already known programs and their silent switches.

At the top right of the program, you'll notice a field for 'Program Path'. This is



▲ Apparently setup will complete in approximately 33 minutes. If Microsoft time were real time, we'd be in a lot of trouble.





### ▲ Install your essential programs from the beginning. You could even create an installer to copy across your FireFox bookmarks.

where RunOnceEx.cmd will be looking for our installers later. By default it points to %cdrom%\Apps\ – so for the sake of easiness, once you've added all the programs you want to the list, create an Apps subfolder off your C:\XPCD directory and dump all your installer executables in there. It sounds obvious, but before you're done, make sure that your executable names actually match those that are in the list!

Finally, go to File -> Save, and save the file as RunOnceEx.cmd in the C:\XPCD\SOEM\$ folder. Make sure to enter the extension manually, as the program will not add it for you. Browse to the C:\XPCD\SOEM\$ folder and create a txt file called cmdlines.txt, edit it and enter:

#### [COMMANDS] "RunOnceEx.cmd"

Then save. This will execute the file you just generated after Windows finishes installing, thereby installing all the programs you previously listed.

But what if, no matter what you do, you can't install a program silently? Well for that you'll need a post installation scripting program – and it just so happens a few exist.

## Autolt!

Essentially a massively glorified macro tool, Autolt allows you to run executables, simulate key strokes, mouse movements, clicks and more. This is incredibly useful for bypassing dialogues in installer programs, and accessing areas of Windows that aren't usually accessible through unattended means – perfect for customising your install further. First a warning though: be careful! You could end up destroying vital bits of Windows if you

code incorrectly. It's sensible practice to comment out dangerous lines of code (by preceding them with a semi colon) until you're absolutely sure that they do as intended, and to execute new scripts step by step as you write them to make sure your commands are correct.

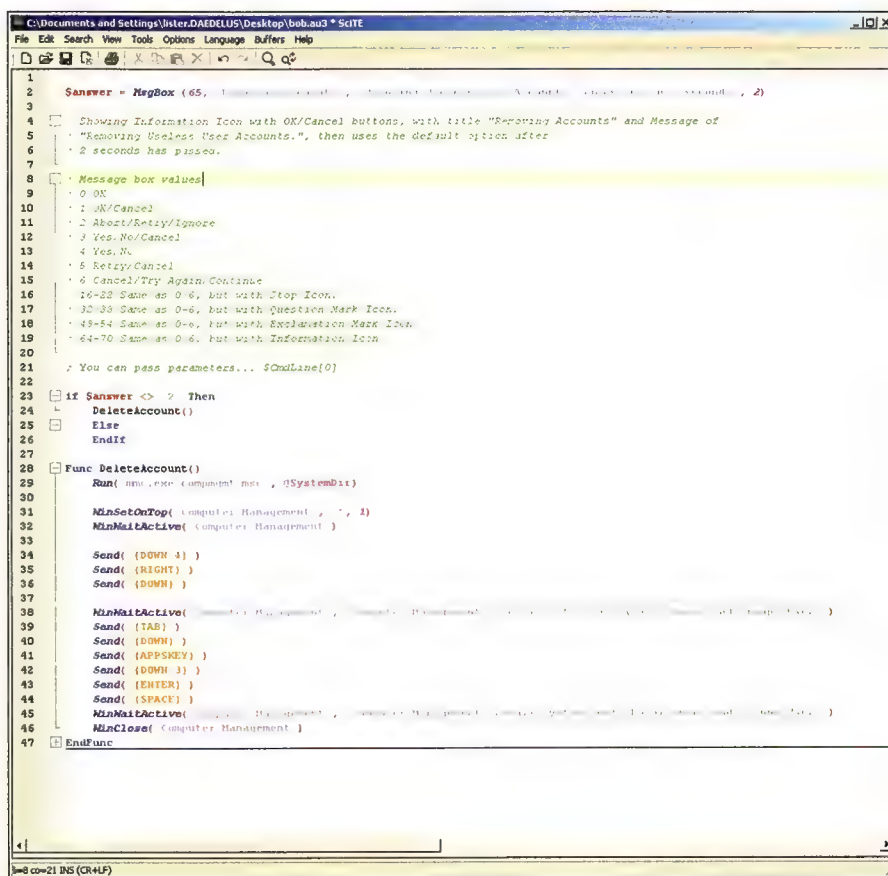
Prophecies of doom aside, to get to grips with what this fantastic tool can do let's write a small script, that will remove that annoying default SUPPORT\_ user that is installed with Windows XP.

Firstly, download the program from [www.autoitscript.com/autoit3](http://www.autoitscript.com/autoit3), and its very useful editor, SciTE, from [www.autoitscript.com/autoit3/scite](http://www.autoitscript.com/autoit3/scite). Install both. Open the SciTE program and type:

**MsgBox (65, "Removing Accounts",  
"Removing Useless User Accounts.", 2)**

This creates a message box (**MsgBox**) of type **65** (this particular number type creates a message box with OK and Cancel buttons with an Information icon), with the title 'Removing Accounts' and the content message 'Removing Useless User Accounts'. If the user doesn't hit any button, then the box will 'timeout' or disappear in **2** seconds. Save the script as 'accountrem.au3' and run it by double clicking to see your message box. Isn't it pretty?

Of course at this stage your message box is impotent – we need to get user input first before it will do anything. To do so, we need to store a returned value in a variable. By default, clicking the OK button returns a value of 1, Cancel 2, and if the msgbox times out, a value of -1 is returned to Autolt. To capture this value, simply



### ▲ Scintillating Scripting with SciTE.



## Installing Programs



Windows is now setting up the following items:

Installing 7-zip

▶ Inserting Registry File

Taking over world

Installing Ubuntu

▲ **RunOnceEx** provides a subtle and useful way to install your programs, silently and swiftly.

put **\$answer** = (the \$ denotes a variable) at the front of your existing line. So you should have:

```
$answer = MsgBox (65, "Removing
Accounts", "Removing Useless User
Accounts.", 2)
```

Now, whatever value is returned from the message box, it will be stored in the variable **\$answer**.

Now that we have user input, let's do something with it. Unless the user manually cancels the process (**\$answer** = 2), we want to delete the **SUPPORT\_** user account. Let's set up a conditional loop to do so.

```
if $answer <> "2" Then
DeleteAccount()
Else
EndIf
```

Here we're saying if **\$answer** does not equal (<>) 2 (the returned value if the user hits the Cancel button), then call the function **DeleteAccount()**. If **\$answer** does equal 2, then end the if loop (**EndIf**). So in English – if the user does not hit the Cancel button within the two second timeout or hits the OK button, then the function **DeleteAccount()** will run. If the user hits Cancel, the msgbox will close and nothing will happen.

But of course we haven't written the **DeleteAccount()** function yet, so we're currently calling nothing! Take a new line, and type:

```
Func DeleteAccount()
```

This declares the function **DeleteAccount()**. Any code below this becomes part of the

**DeleteAccount()** function, until it is closed (thus returning to the normal flow of code) by using **EndFunc**.

So let's execute the Computer Management console, which we need to delete the **SUPPORT\_** user.

```
Run("mmc.exe compmgmt.msc",
@SystemDir)
```

This will execute (**Run**) the Microsoft Management Console (**mmc.exe**) with the Computer Management module (**compmgmt.msc**), from the working directory **@SystemDir**. The @ symbol in AutoIt represents a macro – in this case, **@SystemDir** is a macro for retrieving

your Windows system directory, and will be replaced with that string during runtime (in most cases this will become **C:\Windows\System32**).

In a moment we'll need to start passing simulated keyboard commands, but we don't want to do that while another window is open, so we'll make the window we need always appear on top.

```
WinSetOnTop("Computer Management",
"", 1)
```

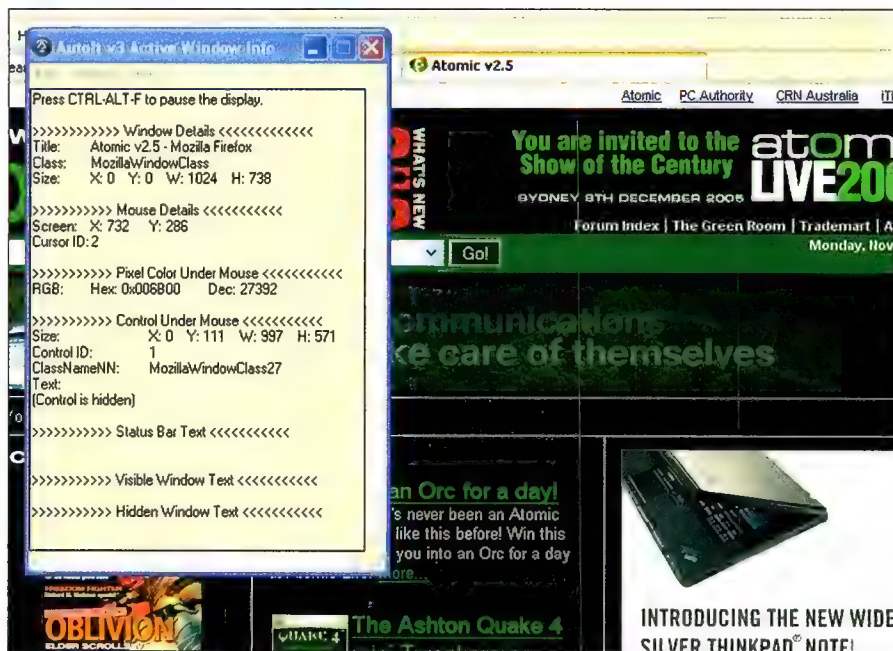
Here we've said to find the window with the title **Computer Management**, with any possible text within that window ("") and set it to always on top (1). There's one more step though before we start pumping in keys – we want to tell the script to wait until the proper window is active first, just in case **AutoIt** is too quick and processes commands too early.

```
WinWaitActive("Computer
Management")
```

Much better. Now since the window is active, we can start sending some keypresses.

```
Send("{DOWN 4}")
Send("{RIGHT}")
Send("{DOWN}")
```

Here we've pressed the down arrow four times, then the right arrow, then down again. In the Computer Management console, this will



▲ I spy with my little eye... AWI lets you pull useful info from windows.



get us to the Users folder under Local Users and Groups. To continue we now need to go over to the right hand pane, but we have to make sure that window has loaded first before we can process any further commands. But how do we determine if it has or not? Go to your Start Menu and open Autolt Window Info (AWI).

Once it's loaded play around a little – you'll notice that there'll be black lines surrounding whatever element you hover your mouse over within a focussed window. AWI allows us to pull information on that hovered element for our uses. So let's get some useful information – open the Computer Management Console (Start → Run → compmgmt.msc), browse to Local Users and Groups → Users and hover the mouse over the right hand side. Check out the Visible Window Text section in AWI – this string is exactly what we need to determine if the window has loaded properly or not.

**WinWaitActive("Computer Management", "Computer Management (Local)\System Tools\Local Users and Groups\Users")**

So here we're pausing the script until the Computer Management window is active, containing the Visible Window Text **Computer Management (Local)\System Tools\Local Users and Groups\Users**. Once this condition is met, we can tab over to the right hand side, navigate to the offending account (this code may vary depending on currently existing accounts), load the context sensitive menu, select the delete option, hit enter, and then the OK button that appears in a message prompt by sending a space.

**Send("{TAB}")**  
**Send("{DOWN 4}")**  
**Send("{APPSKEY}")**  
**Send("{DOWN 3}")**  
**Send("{ENTER}")**  
**Send("{SPACE}")**

Finally we need to close the window – but we don't want to terminate the process before Windows has finished thinking, so before doing anything we'll check once again that the correct window is active.

**WinWaitActive("Computer Management", "Computer Management (Local)\System Tools\Local Users and Groups\Users")**

And then close it, and finish the function.

### WinClose("Computer Management") EndFunc

There you are, your first Autolt script complete, and an annoying user account gone! But we're not finished yet – right click on your script file and choose 'Compile Script' – this will create a .EXE file with an embedded copy of Autolt included so you don't need to have it installed to run the script. Drop the .EXE file into your \$OEM\$ directory and add the name to the end of your cmdlines.txt file, or alternatively copy it to your Apps folder and add it to your RunOnceEx.cmd Creator list to integrate it into your Windows install. For peace of mind it is probably best to execute any Autolt scripts last.

Autolt isn't limited to just executing scripts – you can also build basic GUIs with it as well to provide menu driven scripts. Sadly there isn't enough room to go into more detail, but be sure to check out the excellent help file that's included with the program to further your knowledge. If you're raring for more post install tools, check out AutoHotKey ([www.autohotkey.com](http://www.autohotkey.com)) for a greater level of scriptability and power. Other programs you could look at to ease your application installing include Windows Post Install Wizard (WPI) ([wpiw.net](http://wpiw.net)) and Windows Installation Helper Utility (WIHU) ([www.kalytta.com/wihu.php](http://www.kalytta.com/wihu.php)).

## Registration please, Sir!

Final steps – time to throw in any registry tweaks you may have that aren't covered by nLite. Simply create a standard .reg file, copy it to your \$OEM\$ folder and add it to the end of your commands list in cmdlines.txt. If you want to merge it with the registry silently, stick a **REGEDIT /S** in front of it. If you're a



▲ **Learn the ways of the force... or alternatively spend a little time with Autolt, and you can build your own GUIs.**

registry n00b, check out [www.winguides.com/article.php?id=1&guide=registry](http://www.winguides.com/article.php?id=1&guide=registry) to bring yourself up to speed, or alternatively you could use a program like Unattended Registry Tweaking .NET ([www.msfh.org/board/index.php?showtopic=49320](http://www.msfh.org/board/index.php?showtopic=49320)) to generate a .REG file for you by just checking a few boxes.

## Make it so

When you're happy that everything is prepared, open up nLite, click the refresh icon to scan your existing C:\XPCD directory, and click the Next button until you reach the Task Selection screen. Select Create a Bootable ISO (ensuring nothing else is selected), click Next, Make ISO, enter an appropriate name and save. Test using Virtual PC, or simply burn off the ISO using something like Nero Burning Rom if you want to use it on real hardware. Your customised XP CD is complete!

## The ultimate tools...

There simply isn't enough room to cover all the available options you have these days when customising your windows install – be sure to check out the following tools to see what you can do to add or tweak your uber XPCD.

Multi Boot DVDs [flyakite.msfhhosting.com](http://flyakite.msfhhosting.com)

CD Switcher [www.msfh.org/board/index.php?showtopic=41821](http://www.msfh.org/board/index.php?showtopic=41821)

Lagon Studio [www.stardock.com/products/logonstudio](http://www.stardock.com/products/logonstudio)

NirCMD [www.nirsoft.net/utills/nircmd.html](http://www.nirsoft.net/utills/nircmd.html)

Silence of the Foxes [www.msfh.org/board/index.php?showtopic=43168](http://www.msfh.org/board/index.php?showtopic=43168)

Shell Extensions [www.msfh.org/board/index.php?showtopic=52524](http://www.msfh.org/board/index.php?showtopic=52524)

PowerToys for Windows XP

[www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.msp](http://www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.msp)

Registering File Types with Applications [www.msfh.org/board/index.php?showtopic=31407](http://www.msfh.org/board/index.php?showtopic=31407)





## Tale of two boots

Dual boots and software RAID need not be mutually incompatible, as Ashton Mills reveals.

Let's face it, one OS is never enough. Well, it would be if we had one OS to rule them all, but what Windows lacks Linux has in abundance and vice versa. If you feel the need to install and use both operating systems, don't worry, you're not alone. It's a good feeling, a comfortable feeling even. It shows you're the type of person who likes to experiment, which is usually a good thing.

But anyone can dual-boot. This is *Atomic*, so we go one step further. We're going to show you how to setup a dual-boot RAID Windows and Linux system. Both operating systems, both RAIDed, on a single machine without hours of endless hair pulling (hopefully).

### Wait, isn't this easy?

I bet you're wondering what the problem is in this day and age with onboard RAID controllers. Well, for a start they're not real RAID controllers. Unlike dedicated (and expensive) hardware RAID cards, all onboard motherboard RAID implementations are affectionately known as 'fakeraid' because they're not hardware at all. The actual RAID processing is still done via your CPU through drivers. This means between the OS software RAID and the fakeraid controller, there's not a lot of difference, with these exceptions: software RAID is more flexible, portable, and easier to install with operating systems than fakeraid.

It's flexible because you can RAID just the partitions you want, portable because you can move the drives to another system and they're readable (compared to fakeraid controllers which require you to use the same controller family) and easier to install because you don't need some fiddly F6 install floppy driver for Windows or the extreme hassle of trying to get fakeraid controllers working through a Linux install.

Software RAID, under both operating systems, is the shiz. Plus anyone can do it with just standard controllers. So that's what we use!

### Laying it out

Naturally, start by planning the partition layout you want to use. For the purposes of this tute we'll use a layout that looks like the one in the diagram below.

This layout assumes two drives to be setup as RAID 0 in each OS. We're using software RAID, so naturally this requires the OS to be installed first, at least for Windows – oddly, the Microsoft Windows installer is unable to read its own dynamic disks that are used for software RAID, so you can't create them first and then install onto them. As a result, the Windows boot drive needs to be installed on its own partition.

Linux has no such problem.

In our diagram (below) we treat the first partition of the first drive just the way Windows

likes it – as a C: boot drive. This is also where the NT boot manager will naturally go.

You can however point the Windows core and/or the 'Program Files' directory to another drive. This certainly helps in putting all your apps and games on the RAIDed partition, but not Windows itself (as again, the installer can't 'see' the RAID).

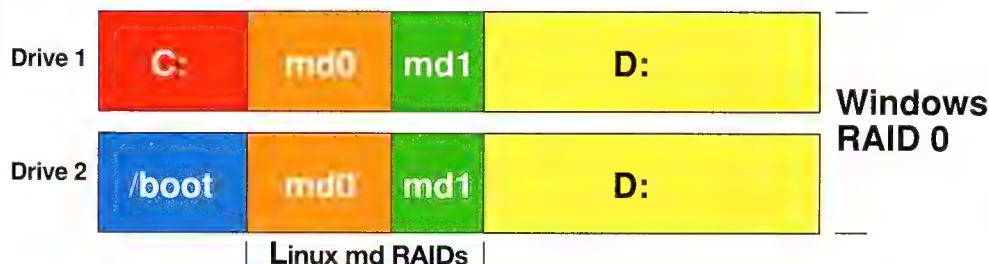
The first partition's counterpart on the second drive is a great place to put your /boot directory, your /home, or anything else for which you don't want to risk to the redundancies (or lack thereof) of RAID 0. These directories don't, after all, really benefit from RAID anyway and it means you can happily re-install your Linux desktop without wiping your /home.

### Windows

Lets start with Windows.

- 1** Assuming a blank drive, boot your Windows install disk (using your own slipstreamed XP super-disk, of course – see page 70) and at the partitioning stage create a single partition where you'll install Windows.
- 2** Do the deed and install Windows. After you reboot into your fresh desktop click Start --> Run and type in 'diskmgmt.msc'.

Yeah, it's odd to recommend it, but it does the job – now use the Windows disk management interface to setup all the remaining partitions you need, as per the layout of your system, including where you'll be installing Linux. There's a reason for this: namely, Linux fdisk can't see or use Windows Dynamic Disks. What's a Dynamic Disk? You're about to make one.



▲ Our sample partition layout for dual-boot dual-RAID sexiness. Mmm... RAID.



**3** You'll note that while all the drives are listed as 'Basic' you won't find any software RAID options for setting up your Windows software RAID drive. To access this, right click on the drive icon in the panel and select 'Convert to Dynamic Disk'. Dynamic disks are Windows' way of doing nifty things like JBOD and RAID. Unfortunately, it requires modifying the partition table to do so, and into a format only Windows understands (but *not* the Windows installer. Nice).

**4** You'll see your drives change colour, but the partition structure remains the same. Right click on the partitions you set aside for Windows and delete them.

**5** Right click on either one of the empty space partitions you want in the RAID and select to create a 'striped' partition.

**6** Select the other partition from the list, click 'Add' and create your software RAID 0 array.

**7** Format it NTFS as you would any other partition.

Now, it's time for Linux.

## Linux

Reboot with your favourite distro install disk in the CD drive. For this to work you'll need a distro with a kernel on the install CD that supports two features: MD and LDM. The first, MD, is the multiple-disk driver – ergo your software RAID support. It handles everything from RAID 0 to RAID 6 and JBOD. The other allows Linux to read and work with LDM, or Logical Disk Manager (aka Dynamic Disk) partitions. Without the LDM driver, the kernel only sees a generic unified partition which Windows uses as its 'Dynamic Disk' format. Thankfully the LDM driver for Linux exists, or this tute wouldn't be possible.

Generally, MD and LDM are so common any modern distro should have them built into their kernels. If they don't, it's probably time to change distro. If you prefer to build your own kernel on an install disk, you'll find LDM under Filesystems -> Partition Types (then select 'Advanced partition selection' and 'Windows Logical Disk Manager') and the MD driver under Drivers -> Multi-disk driver.

**1** At the partitioning stage you should be able to see and manipulate the same

```
mc - /etc
File Edit View Terminal Tabs Help
Martigen dev # fdisk /dev/sdb
The number of cylinders for this disk is set to 9039.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)
Command (m for help): p
Disk /dev/sdb: 74.3 GB, 74355769344 bytes
255 heads, 63 sectors/track, 9039 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1   *           1         654       5253223+   42   SFS
/dev/sdb2             655       9039      67352512+   42   SFS

Command (m for help): q
Martigen dev # dmesg |grep LDM
sdb: [LDM] sdb1 sdb2 sdb3 sdb4
sdc: [LDM] sdc1 sdc2 sdc3 sdc4
Martigen dev #
```

### ▲ fdisk can't see the Dynamic Disk partitions, but the kernel can.

partitions you made in Windows. All you want to do here is create the Linux software RAID 0 array and install Linux onto it, with the exception of /boot. You may need to modprobe the MD driver if your distro doesn't load it. The LDM driver is a compile-in only affair.

**2** If you're doing things the manual way (such as with Gentoo) you'll need to make sure the tools from either the 'raidtools' or 'mdadm' packages are available on the install disk. You can assemble your RAID 0 array with mdadm like so:

```
mdadm --create /dev/md0 /dev/sda2
/dev/sdb2 -n 2 -l 0 -c 64
```

Distributions that have no problem loading and using both MD and LDM include Red Hat, SuSE, Mandriva, and Gentoo. The first three even include install features to setup RAID arrays from partitions for you. Neat!

**3** Allocate your partitions as per the layout you want, and install Linux. Going by our diagram this means allocating /dev/sda2 and /dev/sdb2 to md0, /dev/sda3 and /dev/sdb3 to md1, and installing / to md0 and allocating your swap to md1. Note you *can* use other methods of building drives into spanned file systems with evms, device-mapper, and the like but as you'll see sticking with straight MD

keeps it simple and, as we'll cover below, cross platform.

## The boot loader

So far, it's all been relatively simple. It's just a standard dual-boot install making use of software RAID under each OS, and it's been made possible by the kernel's support of LDM. Which if you think about it presents us with a bit of a chicken and egg problem: In order to see LDM partitions, the kernel needs to load. But in order to load the kernel... the partitions need to be visible.

No problem! Well, actually it is a little. There are two ways to handle this.

- The first is to install your /boot and boot manager to a third hard drive. Even if it's just a simple data drive, there's nothing stopping you making this your bootable drive in the system, loading a Linux boot manager, and booting Linux or Windows accordingly. It's certainly a safe and simple option. Alternatively, this boot device could be a USB key.
- The other option is to install LILO onto the second drive (so as not to overwrite the Windows NT boot manager, which you need). LILO can handle LDM partitions, whereas Grub cannot, so it's your only choice here. Your distro, if it's got a nice installer, will offer to install LILO for you and will even find and add to the boot menu your Windows boot.



## A RAID by any other name

Just because you're running different operating systems, and different software RAID arrays no less, doesn't mean the two can't play together.

You'd think that the chances of Windows being able to read a Linux software RAID array are nil. And you'd be right. You'd also think that, naturally, Linux wouldn't be able to read that lovely NTFS Windows software RAID array from Windows.

But in actual fact it can. To be more precise, the MD driver can, with no more configuration than you've already done to setup a Linux software RAID array.

The easiest way to do this on a permanent basis where you can mount and unmount the Windows RAID as you desire is to set it up as an entry in your `/etc/raidtab`, like so:

```
raiddev    /dev/md2
raid-level  0
```

```
chunk-size 64k
persistent-superblock 0
nr-raid-disks 2
device     /dev/sda4
raid-disk 0
device     /dev/sdb4
raid-disk 1
```

The two most important settings to specify here are 0 for the persistent superblock (because of course NTFS partitions don't), and to use a chunk size of 64KB. To understand the relation between chunk and stripe, see the 'Chunk or stripe?' boxout. And of course, you need the NTFS file system module installed or loadable. After that, accessing the Windows RAID is as simple as running:

```
raid0run /dev/md2
mount -t ntfs /dev/md2 /mnt/windows
```

Or whatever directory you want to mount to. Note the `raid0run` command is part of the 'raidtools' package. You can probably use `mdadm` to force it to run, but `raid0run` will do as it says without playing with switches. The `raid0run` command forces the assembly of a RAID device, irrespective of whether the partitions sport a valid superblock or not. Naturally, when you're done, you can unmount it as follows:

```
umount /mnt/windows
raidstop /dev/md2
```

Note that if MD complains that there aren't enough MD devices present in `/dev`, you can make another like so (the example here being `md2`):

```
mkknod 2 b 9 2
```

**man mkknod** for all the gossip.

## Booting up

Our dual-boot dual-RAID system is almost complete.

Similar to the boot issue, the loading of the MD driver to assemble RAID arrays is also a bit chicken and egg. How can you boot your root partition off the RAID array if the configuration for arrays is stored in the `/etc/raidtab` or `/etc/mdadm.conf` files?

No problem! The MD driver is capable of assembling arrays on the fly. Add the following to your kernel statement in the boot loader:

```
md=0,0,4,0,/dev/sda2,/dev/sdb2
root=/dev/md0
```

The first value is the MD array number, the second is the RAID level, the third a logarithmic base 2 value offset by 12 (yeah, easy) representing the chunk size, and the fourth is a merely a compatibility value. The last two, of course, are the array constituents. So for example, your kernel command may be:

```
/bzImage-atomic1 md=0,0,4,0,/dev/sda2,
/dev/sdb2 root=/dev/md0 elevator=cfq ro
```

Hang on, don't RAID partitions sport a spiffy 'RAID autodetect' flag ('fd') on the partition, so MD can detect and build arrays on the fly? Well, yes, but it depends on how your array was originally built with a 'persistent superblock' or not. And keep in mind Linux `fdisk` can't read

LDM partitions (because it needs to access disks directly), and so can't set this flag for you. All `fdisk` sees are the Windows LDM container partitions (seen type 42, 'SFS').

Regardless, we don't need to rely on this when you can specify the array components at the command line and always ensure the right partitions are constructed accordingly.

And that's pretty much it. You can boot Windows through the boot menu (if your installer didn't do this for you, grep for adding an NT boot loader to it) and of course Linux. Windows will boot off a single drive, but Program Files and everything else (such as games) can be installed to the RAID partition (D: drive). Linux has its kernel stored/loaded on a single drive

in `/boot`, but loads the root from `/dev/md0`. And don't forget to check up on your arrays by catting `/proc/mdstat`.

## Conclusion

Welcome to dual-boot, RAID 0 goodness. It's a little fiddly the first time, but once you're aware of LDM and confident to specify your arrays at the kernel command line, it's pretty simple. Just how fast can software RAID 0 go? Well, on the Ash-man test system (2 x 10k Raptors), we have:

```
Windows D: Sandra - 111MB/s
/dev/md0: hdparm - 136MB/s
```

And that's simply sweet.

## Chunk or stripe?

Usually RAID 0 devices are referenced by the size of the information that's literally 'striped' across the drives in your array. Most onboard RAID controllers and Windows refer to this block of information as the *stripe* size. The default stripe size for a software RAID array under Windows is 128KB.

Linux does things a little differently. In Linux, MD devices are configured with a *chunk* size. This isn't merely another name for the same thing. For the MD driver, data is striped across drives in *chunk* size, so for example a 64KB chunk over two drives under Linux is the equivalent of a

two-drive 128KB stripe array under Windows. Which is why you use the 64KB setting to mount your 128KB stripe NTFS RAID 0 array.

If you don't mind playing with your data, this can actually be seen by running and mounting your Windows software RAID 0 array with a chunk size near but not exact to the default - for example, using a 32KB or 128KB chunk size. Some parts of the directory structure will be perfectly visible (and accessible), while others will generate read errors (namely, those files that would be striped). It's a fun insight into RAID!





# Thermaltake Liquid Cooling

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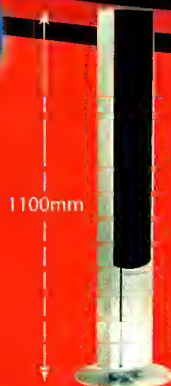
## External CPU Liquid Cooling



### CL-W0020

#### Tribe - CPU Liquid Cooling

- 4-in-1 Copper CPU waterblock for efficient heat transfer. Supports Intel LGA 775/ 478/ AMD K8/ K7
- High performance radiator with 12cm blue LED adjustable fan (1300~2800rpm)
- Quick install connectors; for fast installation
- UV reactive coolant and water tube
- Compatible with other liquid cooling accessories
- External unit with carry handle



### CL-W0040

#### Symphony - CPU Liquid Cooling

- Home theater style liquid cooling
- 4-in-1 Copper CPU waterblock
- Dual liquid water pump for extra performance
- Five silent 12cm fans inside, 16dB each
- UV reactive coolant and water tube
- Anti-evaporation design; maintenance free for 10,000 hours
- Compatible with other liquid cooling accessories

## Maintenance Free Liquid Cooling



### CL-W0065

#### Silent Water - CPU Liquid Cooling

- 4-in-1 Copper CPU waterblock
- High performance radiator with 12cm adjustable fan
- Anti-evaporation design; maintenance free for 10,000 hours
- Compact design; pump, tank & radiator in single unit
- Easy installation

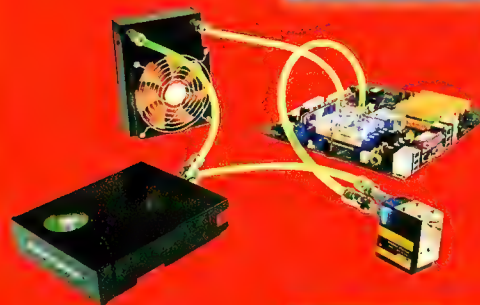


### CL-W0052

#### Tide Water - VGA Liquid Cooling

- Copper VGA waterblock. Supports NVIDIA & ATI
- Copper radiator with silent fan, 17dB
- Anti-evaporation design; maintenance free for 10,000 hours
- Compact design; pump, tank & radiator in single unit
- Fits into PCI slot
- Easy installation

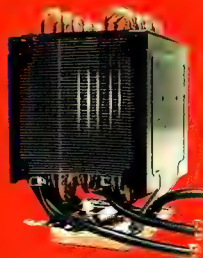
## DIY Internal Liquid Cooling



### CFAN-W0005

#### Big Water SE - CPU Liquid Cooling

- 4-in-1 Copper CPU waterblock
- High performance radiator with 12cm adjustable fan (1300~2800rpm)
- UV reactive coolant and water tube
- 5.25" Drive bay liquid tank
- Compatible with other liquid cooling accessories
- Motherboard not included



### CL-W0037

#### Volcano 4005 Heat Exchanger - CPU Block

- CPU water block upgrade kit
- Radiator and CPU water block in single unit
- Easy installation and minimised liquid evaporation
- Compatible with Thermaltake and other liquid cooling
- Support 80mm or 90mm fan

## Accessories



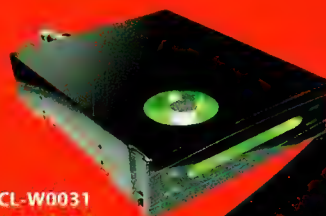
### CL-W0032 AquaBay M1

- Liquid level indicator showing liquid level in system
- Liquid flow indicator showing liquid movement in system
- Fits into dual 5.25" drive bays



### CL-W0021 AquaBay M2

- High performance radiator with 12 cm silent fan, 16 dB
- Fits into 5.25" drive bay



### CL-W0031 AquaBay M3

- Liquid tank
- Transparent window indicating water level
- Fits into 5.25" drive bay

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# The mineral oil PC, Part 1

Water cooling is for n00bs. Why cool just parts of your PC when you can cool the whole lot, power supply and all? **Ron Prouse** submerges an entire PC into liquid, and flips on the power switch...



## Suppliers

**PC Case Gear:** [www.pccasegear.com](http://www.pccasegear.com),  
Ph 03 9584 7266

- Swiftech MCP655 pump, \$139.00
- 4 Litre 12VDC Refrigerator, \$39.50
- ClearFLEX 1/2" tubing, \$7.50 / Metre

**Rasch Industries,** [www.rasch.com.au](http://www.rasch.com.au),  
Ph 08 8299 0266

- Fabrication of the Acrylic tank -  
price dependant on specifications
- 1/2" PVC hose fittings - \$12.00

## Tools

The tools used in this part of the tutorial are mainly those found in the average garden variety shed, including a hacksaw, jigsaw, 100mm vice, tinsnips, grinder and finishing belt, power drill and bits, hole-saw, metal files, 3mm tap, sandpaper and some acrylic sheet off-cuts, aerosol paint, plastic glue and, of course, a large quantity of mineral oil. The main requirement is a decent bench or table, providing a solid, flat surface to operate on. Source these tools before you start.

## DISCLAIMER

**B**ack in the mid-1990's, rumours were rife about a group of hardcore overclockers who were crazy enough to try and cool their PC's with water. 'Experts' at the time dismissed the stories as myth and vapourware, while any pictures of such hardware were blown off as Photoshopped nonsense. After all, the indisputable scientific fact was that electricity and water don't mix, and one drop of the later would surely destroy anything powered by the former. The sceptics' final word was simple – there was no advantage of cooling with water, as the heatsink/fan combinations of the time were easily able to cope with the task.

Never say never.

Ten years later, with water cooling technology now firmly entrenched amongst many performance PC enthusiasts, and quickly spreading into the mainstream market, the question that a lot of people have been asking is, 'what's next?'

There have been several contenders enter the market offering extreme cooling solutions, mainly using thermosiphon technology (such as Asetek's Vapochill), however none of these products have ignited the imagination the same way that the early water-cooling experiments did.

Why? Simply because we demand a more hands-on approach to our cooling insanity, and we know there is a far greater ceiling to push than off-the-shelf products allow.

So, naturally, we decided the next step had to be whole-PC cooling. Afterall, what could be better than submerging an entire PC in its own super-cool pool?

Interestingly enough, this sort of thing isn't just the domain of hobbyists and enthusiasts. Driven by the opportunity to gain commercial control of emerging markets, there are some big boys at play in this arena.

In fact, while planning for this project we contacted 3M on the availability of an excellent non-conductive coolant fluid we had researched called *flourinert* that would be ideal as a submersive liquid.

Phil Tuma, a Heat Transfer Application Engineer (how's that for a title?) from 3M was thrilled with the idea, and replied with:

*"I am writing to offer you my technical assistance as you move ahead [with this project]. As liquid cooling enters the mainstream market, there are many Fluorinert and Novec fluid-based technologies being considered, and I have been doing research in this area for two years now."*

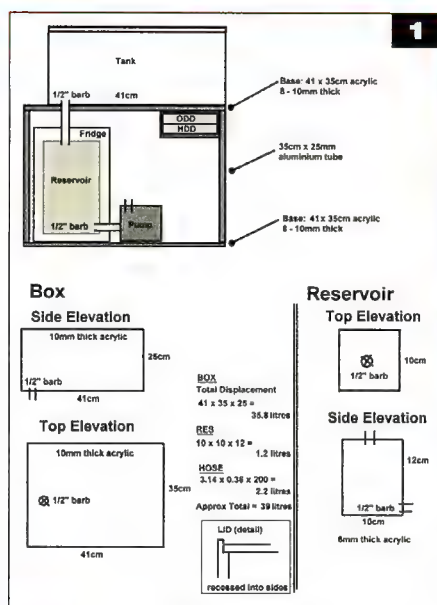
Flourinert is an ideal substance because it has fantastic heat transfer properties, is non-conductive, non-corrosive, non-toxic and has a 'gel-point' (the stage at which it begins to get thick or gelatinous) approaching -200°C. Brilliant stuff for our purposes!

However, as we found out, it's extremely expensive at over \$US100/litre, and so while 3M was willing to send us Flourinert for this project it wasn't something we could fairly say you the reader could get a hold of easily to follow the tutorial. With affordability in mind we moved to a fallback of *mineral oil*, which can be obtained just about anywhere and is almost as good for our purposes.

So if you're interested in building a machine that truly, totally, takes it to the next level – and by next level we mean sticking a PC into a big tank of liquid and turning on the power! – then this two part extravaganza is for you.

Do we think that this is the future of computer cooling? Maybe not, but we have forged ahead with Neo's final comment from *The Matrix* ringing in our ears, 'I did not come here to tell you how this is going to end. I came here to tell you how it is going to begin...'

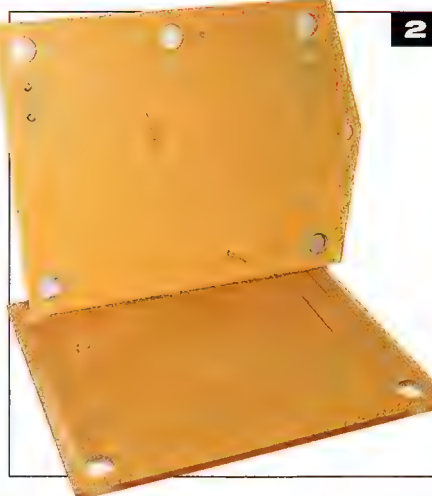




For this project we decided to go with full component immersion, although another, less viable option for the home DIY'er, is a 'spray and scavenge' (S&S) system. With S&S, all of the hotspots (CPU, GPU, Northbridge, etc.) have chilled liquid sprayed directly onto them, the liquid then runs down over the mobo, is collected in a sump and recirculated. S&S requires high pressure/volume pumping to deliver enough liquid through a plethora of fine spray-heads, and also needs an extremely effective cooling system to chill down the reservoir of coolant. This method is often used to super-cool electrical components, using a liquid nitrogen bath to cool the spray medium to below zero temperatures. Neat, but a bit complicated! So we have a better solution.

The first step, as always, is planning. Having looked at the physics of pumping a thicker-than-water (higher viscosity) liquid around through an open-loop system, it soon became obvious that gravity was going to be a useful tool in this application. Full immersion obviously requires much more liquid than S&S, as the tank has to be large enough to comfortably contain all of the components, including the power supply. By this attribute alone it tends to be an 'ambient temperature' solution rather than a sustainable sub-zero cooling system. But more on that later. We decided that acrylic was the best material to construct the tank, reservoir and stand out of, as this would avoid the possibility of contaminating the cooling liquid.

With the basic plans detailed, construction of the stand begins, with all of the component locations drawn in. The base and shelf sections are cut out of 10mm



thick clear acrylic using a circular saw, and 5 X 30mm holes were drilled in each corner for the legs to pass through. The top and bottom sections won't be supporting any of the weight of the tank (which will be considerable), and therefore they are mainly just to locate the support legs and stop the structure from twisting. The top shelf is a slightly different shape to the base – the additional, triangular section and hole is a support bracket for the pump outlet hose. Finally, the edges have been polished back to a 'glass finish' using 1200 Wet'n'Dry sandpaper and Brasso metal polish.

The support legs will be transferring all of the weight of the tank down onto the bench top, so it's important to make sure that the acrylic tubing has sufficient strength and rigidity – these have been fabricated from 35cm lengths of tube that has a 30mm OD and a wall thickness of 5mm... so, in effect, they are 33 percent solid! To keep the ends square, masking tape is wrapped around the tubing to stop chipping, and then sliced to length using a cut-off saw. The five legs are then glued into place with Weldon #16 acrylic cement, which was chosen as it gives a few additional seconds for adjusting the joints.



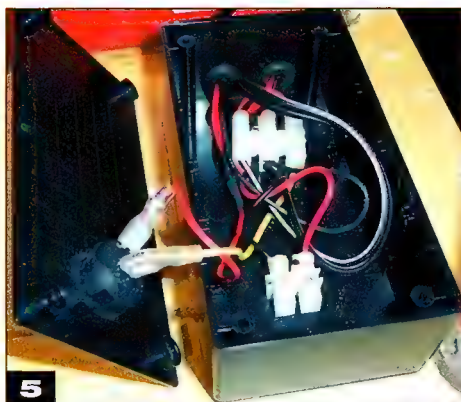
For aesthetics, tri-coloured cold cathode tubes were placed inside the four corner tubes and held in position with foam end-caps. Yes, we never forget the bling factor!

With the base taking shape, the next step is to prepare the cooling device – a four litre 12VDC refrigerator that can cool its interior to 20-25 degrees below ambient temperature by way of a 50W Peltier mounted on an aluminium 'cold plate' interior shell. It is worth mentioning that we don't expect this toy fridge – which is curiously common – to have a big impact of the temperature of the 40 litres of oil in the system. The idea is that it will help to maintain the status quo, and stop the tank from slowly heating up over time – keeping the oil at ambient air temperature is the goal.

We deemed that a 50W Peltier was insufficient, so a 75W replacement was sourced from Oatley Electronics ([www.oatleyelectronics.com](http://www.oatleyelectronics.com)) and swapped in. 20mm holes have been drilled through the top and right hand side of the fridge body, for the inlet and outlet hoses to pass through. The outside base of the fridge is also drilled, and countersunk self-tapping screws used to attach it to the base of the stand.

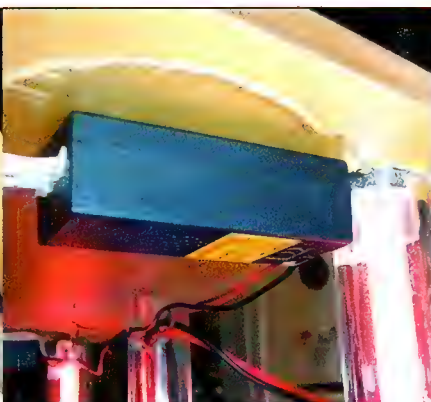






Time to wire up the lower level. The leg at the centre-rear of the base is used to route all of the wiring, keeping it neat and protected. As all of the lower level components are 12v, a dedicated 12v rail was run out of the Topower 465W PSU, using 10A wire, into a plastic Jaycar project box, which is screwed to the base. An on/off switch was fitted into the lid to control the cathode lighting, and two screw connector blocks used to power the fridge and Swiftech MCP655 pump. The two cathode inverters were glued and screwed to the underside of the shelf, and the wiring secured with cable ties. The pump, powered by the PSU, is wired in a 'switched on by the PC' configuration, whereas the fridge has its own on/off switch built in.

The reservoir is fabricated from 6mm cast acrylic, with a footprint that takes up the maximum possible floor-space of the fridge coldplate, and two 1/2" barbs are fitted for liquid flow. Like a conventional reservoir, its inclusion is to ensure that the pump has a bubble-free flow of coolant, however the



positioning of the 1.2L unit is designed to keep it full at all times – this will give the fridge a better opportunity to chill the oil down slightly. The inlet fitting is threaded directly into the reservoir body, while the outlet barb screws into a fitting plastic welded into the side. Initially we used 'plumbers' Teflon tape to seal the screw-joints, however persistent seeping led us to believe that the oil was having an adverse effect on it, so we experimented with a new product, Unasco thread-sealing compound, a PTFE fibre reinforced paste, which fixed the problem immediately.

With the reservoir installed in the fridge, it was time to check all of the base components for structural rigidity and functionality. The pump was installed, placed on top of two laminated 10mm acrylic spacers to align the inlet to the reservoir outlet. The fridge, pump and cathodes have a total power load approaching 12V / 10A, well under the available 12V / 20A of this power supply, so testing was just a matter of making sure that everything is wired-up correctly. Testing



structural rigidity was almost as simple... stand on it!

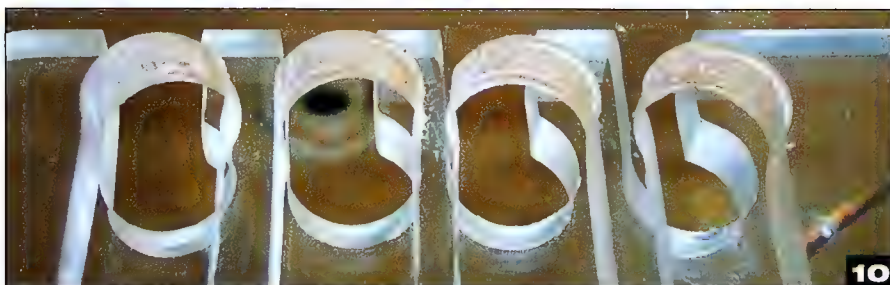
If it can handle 85kg of geek then it should be fine with the 50-or-so kg final weight of the main tank.

Big thanks go to Darrin Webb, Fabrication Manager, at Rasch Industries ([www.rasch.com.au](http://www.rasch.com.au)) for making us the main PC-tank. The importance of a structurally sound enclosure becomes obvious when you consider that it will be holding nearly 35kg of oil.

A 41 X 35cm, 'U'-shaped section is bent up from 10mm thick cast acrylic sheet, and side-panels made from similar material are glued into the ends. A 10mm wide X 5mm deep rebate is machined into the top so that the 10mm thick lid is recessed flush with the sides, as this will help to seal the tank from dust and impurities. Like the reservoir, a half inch PVC fitting is welded into the base so that a hose barb can be fitted for the lower oil drain. The same process is used to fit the oil inflow point in the lid.







With the basic tank constructed, the next step was to add on a few additional brackets for mounting the peripheral components. The hard drive and optical drive need to be mounted outside of the tank, as they will not function in a liquid environment – the ‘thicker-than-air’ viscosity of the oil, and resultant turbulence inside the drives, would impact on spin-up and spindle speeds on both, as well as adversely affect the laser in the ODD and the read/write arm in the HDD. The brackets for the two drives were fabricated from 3.5mm thick Acrylic sheet and aluminium L-section, and were then laminated onto the rear of the tank using Weldon #16 acrylic cement. This position was chosen as it maintains the illusion that they are ‘floating’ in fluid.

A 10mm thick acrylic off-cut is shaped into a handle / mount to support the weight of oil in the hose that runs from the pump to the top of the tank.

Having components on the outside of the tank adds another dimension to keeping the dirt out while keeping the oil in. We need a place for the IDE cables, KVM (keyboard, video, mouse) leads and the power cords to exit the case, while still maintaining the integrity of the tank contents. The obvious exit point is through the lid, using a series of slotted holes through both the lid and an internal baffle plate, placed hard up against the inner lid. The baffle is made from a 10mm thick off-cut, and glued to the back and side of the tank to give it additional strength. With the lid in place, four 12mm holes were drilled through both layers, and then a hacksaw, or router, used to remove

the excess plastic for the 7mm wide slots. The final touch is to file and sand down the cut surfaces to a smooth finish.

Another small addition that will prove invaluable once the real overclocking adventure begins in earnest – a remote CMOS reset. The prospect of getting elbow deep in oil might be appealing to some readers, but we would rather use a proprietary brand of moisturiser to keep our white, geeky arms soft and smooth. A ‘normal’ reset jumper uses a 3-pin male-out on the motherboard (where two of the three pins are bridged with a plastic-coated jumper), which just happens to be an identical configuration to a standard fan connector. That means that a 3-wire fan lead can be modified to plug onto the motherboard header, and the male (jumper) connection can be duplicated elsewhere in the case. In this application it is mounted to a plastic block and glued to the inside of the tank just above the final oil level. Just be careful to get the ‘wires Vs pin configuration’ right, or you *may* end up burning out a mobo.



This is the status quo at the end of Part 1, with the basic enclosure complete and successfully reticulating the coolant oil. One of the attributes that we were striving for with the Oil PC Project is to make it a viable computer for the longer term, not just a quick experimental plaything.

That comes later.

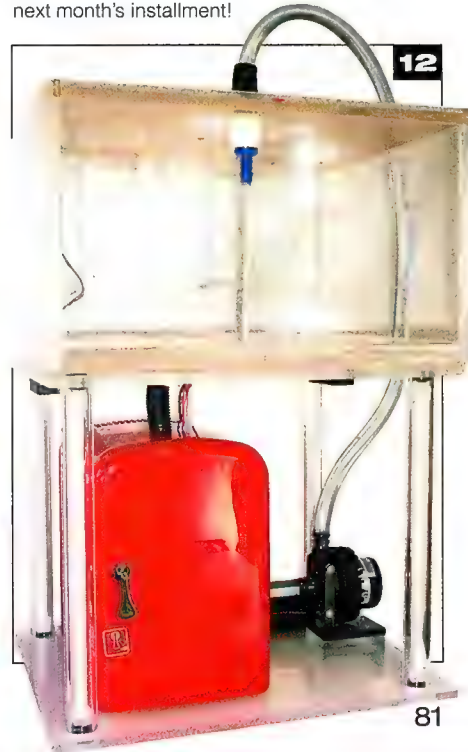
One of the potential issues is how the 12V ‘designed for PC use’ water pump would cope with handling high viscosity fluid such as oil is now answered; it may have impacted noticeably on the flow rate and pressure, however the pump is still working effectively and without showing signs of obvious strain, such as getting hot. Tuned to the maximum voltage, the flow rate is approximately 12L/Min, 60% of the pumps rated-flow in water. It will be interesting to see how this use impacts on the claimed 50,000 hour ‘Mean Time Before Fail’ (MTBF) that Swiftech claim for this pump.

With the larger, 75W Peltier, the fridge gets the reservoir undeniably frosty in a short time, but again, it will be interesting to see if it is able to keep the tank at ambient over an extended period of time.

Next month in Part 2 we cover fitting in the hardware, switching, drives and then getting it all wet. And, naturally, turning it on and seeing the results!

Included will be overclocking benchmarks and adding an extra ingredient: *dry ice*... seeing how that affects the viscosity (will the oil still pump?), and seeing how far in below zero temperatures we can get the oil in the tank.

All these questions and more answered in next month’s installment!





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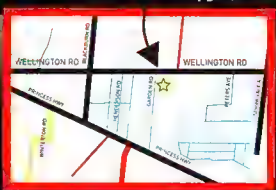
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# gameplay

Games, gaming and gamers covered Atomic-style



The magic season of gaming continues unabated. Seriously, can anyone remember a Christmas like this one? Bamboozled, is what we are. We expect you are facing the same challenges we are – trying to decide which of the many ‘essential’ games to get into, and how to juggle the gaming time with the jolly season and all it brings.

Personally I just can't get enough of Civ 4, but I'm also finding a whole lot of satisfaction with AoE3 and its skirmish mode. For an hour or two of blissful strategy gaming a bash at AoE3 is just the ticket.

How good is AoE3? The talents at Ensemble have shown their mastery of design restraint. It would be all too easy to overload the classic Age formula with features for the sake of it, instead, bless their cotton socks, the designers have only added a couple of new features which could be described as major, and they're both supply-related, not combat or even base-building. The home port in Age is a little odd and anyone who wants to challenge its real world feasibility has plenty to chew on. Yes yes, we agree too that it's a little silly that a supply ship can be requested any old time and

manages to travel half way around the world in a few seconds, but this is the Suspension of Believe Dept right here so we're down with it. The other big chance is the supply lines on the map. What a brilliant multiplayer element it is too. Some players will do anything to control the road and upgrade it to rail, with all the free bounty it brings, others players I've seen just love it when someone goes all out with that tactic, as it lets them knuckle down to traditional base-building and raising a decent army while the other punter is fixated on train stations. As always with RTS games timing and following a pattern of building is critical and it's kind of funny to see knobs get taken down by pros who really know what they are doing with this game.

I'm looking forward to the holidays so I can get stuck into Civ 4 multiplayer, because one really needs a holiday-length of time to do that. However you spend your holidays, I wish you and your family a wonderful Christmas season. Be good to each other, except in the game.

Come play Ben's game.



this month



## Scanner

Pandemic and BioWare join forces. Read about it all here!



## Talking Head

Logan Booker discusses delays. Conclusion next month.



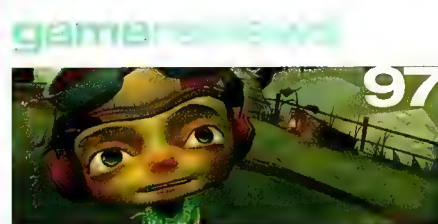
## Pipeline

Previews of games that look great. See them, expect them.



## Engine Room

It's a mad BigWorld. or a big mad world. Logan Booker takes a look.



## Psychonauts



## Age of Empires 3

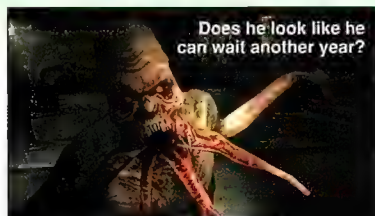


## Matrix: Path of Neo

## King Kong



## short circuits



It should come as no surprise that THQ's first person shooter S.T.A.L.K.E.R.: Shadows of Chernobyl has once again been delayed, the publisher citing an October 2006 release date for the title. There's a good chance the game will be at least a generation behind when it finally arrives and we're having a lot of trouble retaining any enthusiasm for it.

**More delays, this time from Bethesda** and its massive RPG Elder Scrolls 4: Oblivion (covered in detail Atomic, Issue 58). Publisher Take2 Interactive has said that the game won't hit its predicted 'Holiday' 2005 release date and is now aiming for Q1 2006. This of course means that the game has missed the November 22 debut of the Xbox 360, for which it was supposed to be a launch title.

**Unless you've been hiding under the corpse** of a Northrend Yeti, Blizzard recently announced the first expansion to its massively multiplayer online game World of Warcraft. Titled 'The Burning Crusade', the expansion will provide players with new areas to explore and dungeons to delve, including the Outlands and the Caverns of Time, as well as implement two new races, one of which being the Blood Elves for Horde. For more info, check out our BlizzCon rundown, starting on page 12.

**Sid Meier's Firaxis Games** is now under the wing of Take2 Interactive, the company acquired by the publishing giant in early November. Firaxis is the company behind games such as Pirates! and the Civilization series.

## scanner

Industry and online news for the complete gamer



**P**andemic Studios is more than just an Australian game developer nestled in the sunny reaches of Brisbane, Queensland. Yes, Pandemic is much more than a US game developer cradled lovingly in the heat of Los Angeles, California. Pandemic is actually one of the biggest and most successful independent gaming houses, untarnished by the hands of publishers. It's a beacon in the industry with titles like Destroy All Humans!, Full Spectrum Warrior and Star Wars Battlefront under its belt.

Perhaps the only other independent game developer worth mentioning next to Pandemic is BioWare, which has forged a name for itself with numerous innovative role-playing titles, many based on the Dungeons & Dragons license. Gamers everywhere love BioWare. Really, they do.

With this in mind, it made us happy to hear

that Pandemic and BioWare have decided to merge – in a way. In a US\$300 million deal, both companies plan to share resources, staff and IP while retaining their individual names and brands.

'Our creative, production and operational staff are as vital to our success as directors and stars are to blockbuster films, and we are giving them the stakeholder recognition they deserve. Our mutual goal is to build the industry's best place for talent,' said Pandemic president Josh Resnick in the company's press release on the merger.

Joint CEO of BioWare Greg Zeschuk was also positive about the agreement. 'Fans are the real winners in this deal, because we will now have the resources and creative discretion to make the right decisions for our products. This is truly a new way of doing business,' he said.







**...the  
company  
already  
has US\$1.9  
billion  
invested in  
a variety of  
ventures.**

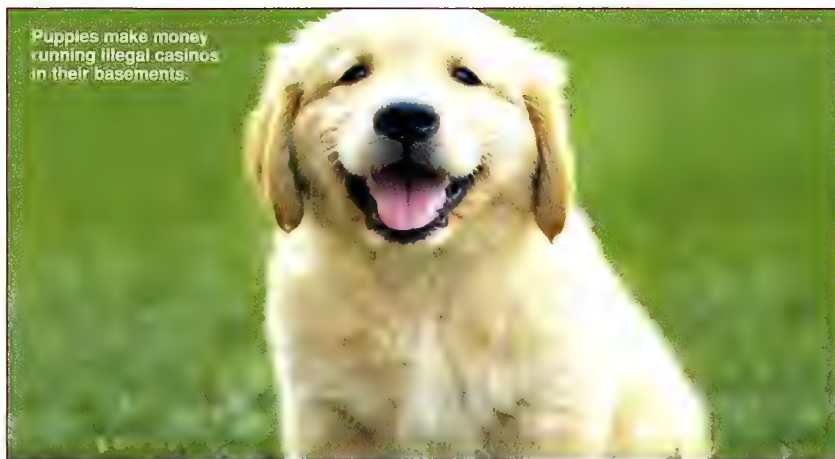
The financial backing for the deal comes from a company called Elevation Partners, co-founded by ex-EA president John Riccitiello and funnily enough Bono, the head of band U2. This strange combination of personalities has resulted in a private equity firm that, according to the Elevation Partner's website is 'aim[ed] to help media and entertainment businesses create and market great content and ensure it reaches the widest audience possible'. The site also states that the company already has US\$1.9 billion invested in a variety of ventures.

While publishers acquire developers all the time, it's unusual for two or more developers to join their business together. With the amount of cash at their disposal and 400-employees strong, the new BioWare/Pandemic could be well-placed in the future to become a publisher. In an interview with gaming website IGN, Zeschuk did not state one way or the other if the two companies plan on going down this road, instead mentioning that fans recognised BioWare and Pandemic as developers and not publishers.

For now, Pandemic CEO Andrew Goldman has stressed that publishers will still play an important role in BioWare/Pandemic's business. 'This is still very much a collaboration with our publishing partners. We will continue to innovate and deliver top-quality hit games and they will continue to transform that creativity into blockbuster titles,' he said.

## geekette

A girl's eye view of the gaming world



**W**hen it comes to playing games, I appreciate I was a little slow off the mark. It took me longer than it should have to get into playing, and I'm acutely aware of the fact that my skills lack in comparison to my colleagues. Then the Nintendogs phenomenon hit my office and all of sudden I am a contender. Actually, I'm more than a contender, I am a master.

Yet my newfound glory has not come without a price. Since jumping on the Nintendogs bandwagon I have discovered a rather unsavoury aspect to my personality. I'm not the laid back, earthy den mother I believed I was. Instead I'm a fiercely competitive, completely deranged stage mother from hell.

I am obsessed with making money. The sweet premise behind the game of caring for a pet has been replaced by a maniacal Best In Show. Every day, my dogs are put through a gruelling training routine and then entered into an endless series of competitions in order to rake in the prize money. This money is then used

to buy more dogs to train  
to keep me in the virtual  
lifestyle of which I

have become accustomed.

Every perceivably altruistic notion has an ulterior motive. I play with them only to earn trainer points so as to unlock more goodies I can buy with my riches, and I groom them to ensure higher points in a trial. Even their daily walk has become an exercise in fiscal reward. I force the dogs to find every present that their stamina will allow, and always stop at the second hand shop where I buy their maintenance goods at a discounted rate. Then, the minute we get home I sell every present found to make back the money I just spent on them.

Karma isn't without a sense of humour though and my little champs have come back to bite me in the ass. Even when the machine is off the dogs get hungry, flea-bitten and run away if I don't regularly check on them. Taking the disk out has not eased my responsibility as the console timer on reload automatically calculates the appropriate neglect, nor has buying a new Nintendogs game – I simply have twice as many dogs to look after now.

Along with my Nintendo DS I must carry around two separate game cartridges, and every second of my free time is spent feeding, walking and bathing a multitude of puppies.

I no longer own  
the dogs. The dogs  
own me!



Kate Inabinet is currently an Animator at Atari Melbourne House. Prior to games development, Kate spent six years in advertising and short film. She studied at the AIC in Canberra where she is still involved as a mentor for the Women in Games Pathway, presenting regularly at conferences on the topic.



Nintendo DS and Nintendogs images courtesy of Nintendo



# talkinghead

Logan tells you everything you really need to know about gaming

## Delayed!

Logan Booker doesn't care about the next best thing.

**A**s a gamer and a journo I've come to expect and live with anticipated titles being inexplicably delayed. Duke Nukem Forever has taught us many things, the least of which being that a game doesn't have to have a release date of any kind. Or up-to-date screenshots. Or even evidence of its existence.

The past month or so however has proven to be a hard one for the gaming-inclined – not only did Bethesda push Elder Scrolls 4: Oblivion to early next year, THQ informed the world that STALKER would be delayed for at least 12 months and Valve was kind enough to let everyone know there was no way in hell Half-Life 2: Aftermath was hitting Steam anytime soon. John Rambo has copped grenade explosions less painful than last month's delays.

What makes it easier to deal with is understanding that games don't get delayed without a reason. I know we all like to think game developers sit around in cosy offices drinking champagne and eating handfuls of the finest truffles the pig sniffers have to offer, but this isn't the case.

If anything, unless they happen to work for a company like id or BioWare, they're more than likely overworked and poorly remunerated – the EA class action lawsuit by its employees earlier this year is a good example of this.

Even a developer as idolised as Blizzard has its issues – as I write this, desks cramp the hallways of the company's building in Irvine, California and it's already organising to move into bigger offices.

In the case of STALKER, GSC Gameworld is still having trouble with the huge, Skynet-like AI that controls the game's NPCs and wildlife. Oblivion just needs more polish – a handcrafted world, unlike a randomly generated one, needs to be painstakingly checked, rechecked and tweaked or there's little point in doing it all by hand in the first place.

As for Aftermath... well, Valve has a reputation for taking it's time getting things done. That's just

the way it's always been. (TeamFortress 2 anyone?) No one knows why, and that's probably because it's the industry's most tight-lipped developer. When someone does talk it's either Gabe Newell or Doug Lombardi. We get the 'Gabe/Lombardi' perspective and that's about it.

Personally – I keep my expectations low and put it all out of my mind. Sure, you can get upset, squeeze out a few tears and write in your unicorn-emblazoned journal using crayons and glitter glue about how the world has wronged you, but there's no point. What you have to accept is that it's not you who is losing out, it's *them*.

While a game is in development it's not making money. So logically a delayed game is going to manifest itself as one of two things on a publisher's balance sheet: a) A big fat zero or b) A big fat bracketed number. For those unfamiliar with the intricacies of accounting, a number in brackets is a negative number.

Or as I like to call it, *anti-cash*.

It's easy to become an incidental fan boy when a game gets pushed back. A heated forum discussion however won't make it get completed faster and neither will an online petition. While you can wait indefinitely for a game to come out (hunger, dehydration, age and zombie plagues permitting), a publisher can only wait so long for a developer to get their product out. Unless they're big – as is the case with Oblivion, or run their own show like Valve – then the publisher will have to make a choice. It can invest more, push it out prematurely, or kill it.

A hard choice, yes, but not for us. For us, the choice is easy: Wait and be happy.

There are too many good games in the world right now just sitting unplayed to feel otherwise.

Hurry up and sign the "Logan needs a haircut petition" at [logan@atomicmpc.com.au](mailto:logan@atomicmpc.com.au)



**Sure, you can get upset, squeeze out a few tears and write in your unicorn-emblazoned journal using crayons and glitter glue...**





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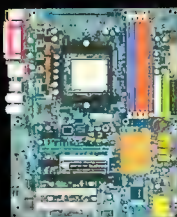
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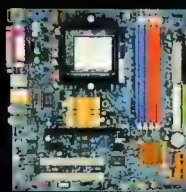
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Release date: Q1 2006



## Rise and Fall: Civilizations at War

**A**n innovative and immensely attractive RTS looms for release 1st QTR 2006. Rise and Fall: Civilizations at War is the latest from Stainless Steel Studios, the Empire Earth people. If you played Empire Earth you'll remember it as an RTS with a twist, being that the game progressed through the ages, from pre-history to the funky future, and as it did the units and technology advanced. Much like Civilization (the Sid Meier one).

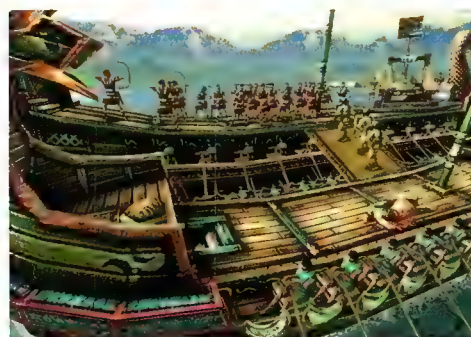
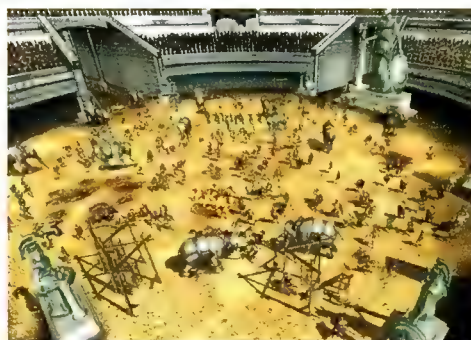
RTS with a twist seems to be a Stainless Steel trademark, because this new game has more twists than a packet of Twisties.

It's set in ancient times, which is spectacularly unoriginal, but it's a great game setting so we're happy. You can play as either the Greeks, Persians, Egyptians or Romans. The game world itself is gorgeous, and that's one of Rise and Fall's strengths. Stainless set out to create a RTS game world that looked at least as good as the best FPS games out there, and boy did they succeed. To get there meant developing a 3D engine with the latest DirectX 9 effects and using them to get the best possible results. Rise and Fall features High Dynamic Range lighting, the latest and greatest in-thing for 3D graphics, which allows brighter-than-white sunlight and reflections, plus bloom effects which make bright things look even brighter. Units will be normal mapped and the environment has full dynamic shadows. Water effects in particular benefit from dynamic shadows, as the waves are bump-mapped and cast shadows upon other waves, making for especially realistic water.

Zooming right up close in Rise and Fall shows the detail and lighting off spectacularly, and it all looks terrific – but who plays an RTS zoomed that close? We certainly didn't in Empire Earth, despite the encouragement of the box shots. In Rise and Fall we will, and there's a tasty and innovative reason why – each race in the game has a Hero, a big and powerful ultra-unit. The Greeks have Alexander the Great, the Romans Julius Caesar, the Persians have Achilles. And here's the good bit: you can take control of the Hero and play him as you would in a 3rd-person adventure or RPG game. That's right – take over the big guy and fight like a mongrel with the troops. This we like. Using your 1337 gaming skilz you can take it to the enemy alongside your troops and fight with the Hero far more effectively than the AI would. You'll be limited to being able to do this only at certain times though, usually right when a climactic battle is at a critical point.

Another reason we like Rise and Fall is the sophisticated mod toolkit that will ship with the game. The gaming community is being spoiled with moddable games lately, so let's hope gamers get behind it and produce fun mods for us all.

Publisher **Red Ant** Developer **Stainless Steel Studios** Platform **PC**





Release date: 2006

## Neverwinter Nights 2

Everybody's Forgotten Realms-based AD&D game is back, this time with better graphics, a stronger character development system and more open-ended gameplay.

For NWN2, BioWare has handed the controls over to Feargus Urquhart's Obsidian Entertainment. Urquhart, one of the big names behind Fallout, has promised to bring a lot to the table for the sequel.

Obsidian has decided to create a completely new story that will be acted out in places in and around the land of Neverwinter. According to NWN2 designer Tony Evans, players won't be forced into making choices, except for those critical to the story, and so there will be a great deal of freedom within the game.

For AD&D fanatics, Obsidian has said that it will be using the 3.5 Edition ruleset for NWN2. This means better combat and character development mechanics over the pseudo-2nd Edition/3rd Edition ruleset in NWN. As a result (and because of the new story) characters from NWN will not be importable into NWN2.

A cool aspect mentioned by Obsidian is the ability to build and maintain a stronghold -- something that has been the desire of CRPG gamers since the beginning of time.

Publisher **Atari**  
Developer **Obsidian Entertainment**  
Platform **PC**



Release date: Q1 2006

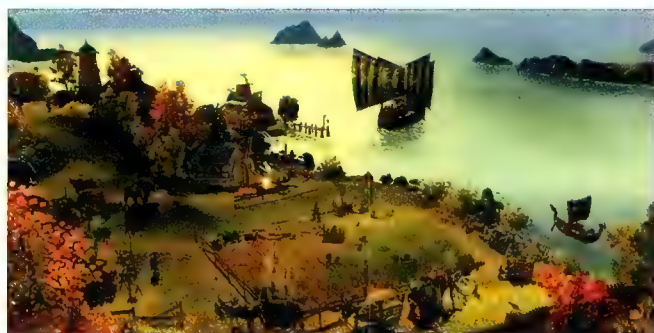
## Paraworld

Sunflowers Interactive is the name behind the Anno series of strategy games, which focus less on combat and more on the intricacies of resource and economic management. The German developer is now putting the finishing touches on Paraworld, an RTS where combat is the focus, but done with a difference. It's set in a parallel universe where dinosaurs and humans co-exist and mankind thus uses dinosaurs as weapons of war. As you do.

The developer has worked hard to create 40 detailed dinosaurs, plus a smattering of non-dinosaur animals. Fighting alongside the huge beasts will be humankind in three flavours: Asian, Nordic and Nomadic. Sunbeam has chosen to allow dinosaurs to stay with you through missions (presuming they survive), picking up experience and skills along the way. The action takes place over five climatic zones: Northlands, Jungle, Savannah, Ice Wastes and good old Lava, which we'll excuse as being actually legitimate in this game.

We're excited about Paraworld because Anno was modelled with meticulous detail, and it appealed to gamers looking for something sophisticated and intelligent, which now apparently means dinosaurs.

Publisher **Sunflowers Interactive**  
Developer **Sunflowers Interactive**  
Platform **PC**







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# WHOLE NEW bigWORLD

Thanks to BigWorld, both Australia and Micro Forte are on the map in the industry of massively multiplayer gaming. **Logan Booker** reports.

**A**ccording to research firm Themis Group in the US, net income from massively multiplayer gaming is expected to hit just shy of US\$4 billion in 2008. Internet portals such as NetEase, SINA and Sohu in China that aren't even dedicated gaming companies make millions of dollars on MMOs.

It's an industry that's still growing, one that's had an influx of new publishers and developers in recent times. All of them are creating their own persistent online games, containing everything from monsters and dungeons to aliens and spaceships.

Australian game developer Micro Forte, the guys behind *Fallout Tactics*, recognised almost a decade ago the need for a solid software foundation for MMOs – a platform that made it easy to create a massively multiplayer game without worrying about load-balancing, 'sharding' (distribution of players across servers) and the complexity of content creation. Not only did it start work on special server software to

cater to these needs, it also developed a cutting-edge client and toolset in parallel.

The result was BigWorld. Seven years of hard work and 46 games later it has more than proved itself as a good decision.

## Worlds ahead

'It [BigWorld] was intended right from the start to be used by other developers,' says Robert J. Spencer, strategic business manager for BigWorld. 'It took five years to get [the] BigWorld Technology Suite to market but we concentrated on solving real-world game development problems and that has resulted in us building the only complete MMOG development platform.'

Ten years ago BigWorld would have been an ambitious project – some could say too ambitious for a place like Australia. Developing any sort of middleware is a daunting task; an MMO middleware presents not only technological hurdles but also creative ones.

However, the support for BigWorld was there.

Early on in development, Micro Forte received a \$1.8 million R&D grant from the Federal Government via AusIndustry – an initiative created by the government to help fund and deliver worthwhile projects and innovations. BigWorld also received a further \$8 million from IT investor Allen and Buckeridge. With close to \$10 million to work with, Micro Forte had everything it needed to come up with an impressive MMO middleware solution.

## Server side!

'We tend to break the BigWorld Technology Suite down to Server, Client, Tools, Instrumentation and Support,' explains Spencer.

'Our server software is actually a cluster of programs working together [database, logging, load-balancing] ... [while] the BigWorld Client is a world-class 3D engine that has been specifically optimised for MMO development,' explains Spencer.

'Our Instrumentation allows developers to see what's going on "under the hood" without ripping their game apart and includes a series of specific tools such as CAT (our Client Access Tool) and more general tools such as embedded Python interfaces.'

Although BigWorld is made of many parts, any MMO player can tell you that the game server is the most important aspect of the entire system. If the server has a problem, everyone has a problem. To keep things such as combat rolls and treasure tables truly random, all the important information is computed on the server, far away from the prying eyes of hackers. This has the valuable advantage of preventing players from cheating however it also presents a massive load to the PCs running the server software, as they have to deal with every client calculation. It's vital then that the software is capable of making use of multiple PCs and their



Dark and Light, just one of 46 games currently using the BigWorld technology.

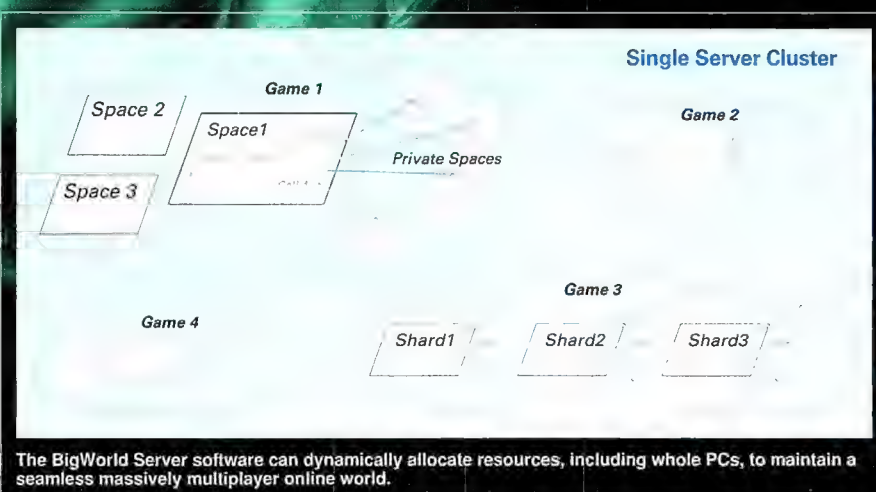


**If a few thousand players are gathered in a single area, the Server will pull systems from other areas to compensate.**

resources to retain a smooth experience.

This is what BigWorld was built to do. Two levels of load-balancing controls how the game's processes are distributed among available resources. Firstly, a system dubbed the 'dynamic server reassignment system' keeps an eye on the bigger picture and takes into consideration fault-tolerance. If a server goes down the reassignment system can detect this and reallocate resources on the fly. A second layer handles resource allocation on the micro level. If a few thousand players are gathered in a single area, the BigWorld Server will pull systems from low-population areas to compensate. This control can work on any level of the game, from a private or instanced server to entire worlds.

'The system is even smart enough to remove servers ... if they are underloaded. The spare servers can then be taken offline, used for hot-swap backups or simply idle during slow periods (reducing electricity usage and heat).'



### Client side!

The other major part of the BigWorld suite is the client side game engine. This is a fully-fledged engine and Micro Forte has not skimped at all on its development.

'We have a modern and extensible data-

driven client that is entirely shader-based and has a number of advanced features such as dynamic day/night cycle, seamless indoor/outdoor environments, plus all the other features that you would expect in a top-tier client,' says Spencer.





Although the focus of BigWorld is on the server technology, the client side engine is more than capable of presenting a lush, active world for the player.

Although it doesn't stand up to dedicated high-spec gaming engines like Doom 3 or Source, it is capable of some impressive effects and is totally compliant with the rest of the BigWorld suite.

'We are always working with specialist developers around the world to ensure that the BigWorld Client is extensible and other technologies and products can be plugged into it,' says Spencer.

But enough about the tech, what are the graphics like? Not bad at all is the answer. The terrain, for instance, uses high mapping to quickly generate realistic looking environments. Day and night cycles and climate simulation capable of rain, snow and fog takes care of the atmosphere. The lighting engine can easily generate lens flares and realistic shadows.

Models also have complex support in the form of animation and morph blending to assist in the transitions between animations and textures. Animations can also be streamed, and the

engine has its own physics engine. BigWorld also supports seamless area transitions using dynamic scenery loading.

Shader Model 2.0 is supported by the engine, so normal mapping, bloom effects and per-pixel shading are all in there. These effects are put to good use in Dark and Light and Citizen Zero, two games being developed using BigWorld, the latter a title from Micro Forte itself.

The engine sounds great, but with over 40 other games using the technology today, there is a legitimate concern for a licensee that their game may look and feel similar to other licensees using BigWorld.

'We've been very careful to be sure that we're building technology, not a game,' says Spencer. 'We do provide example code to our licensees but we expect them to develop all of their own assets and the important game systems that make each game unique.'

'We provide the tools that they can use to build a game but because we started out from

**But enough about the tech, what are the graphics like? Not bad at all...**



A screenshot from Micro Forte's own Citizen Zero. As you can see, the graphics are up there with some of the best engines.



the start to be a third party tool, the BigWorld Technology Suite is actually more flexible than most other 3D engines on the marketplace, which are built primarily to work as a game and are licensed almost as an afterthought.'

## Tooling around

While the server plays arguably the most important role in an MMO, it just wouldn't work without a competent toolset behind it. In fact, creating reliable, flexible tools can be the most difficult part of games development. As a gaming middleware, BigWorld is no different.

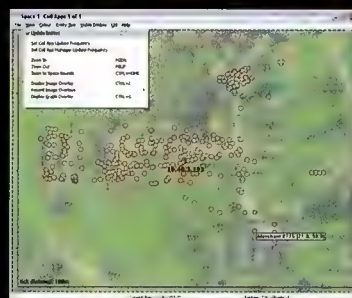
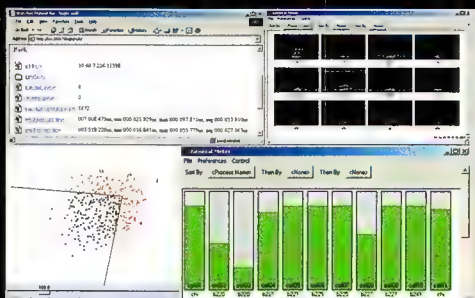
'The server is certainly the hardest problem, although most of our effort these days goes into the tools, as we focus on developing new techniques that we hope will help make MMOs faster, easier and cheaper to develop,' says Spencer.

'We've already developed a system that allows game developers to start creating gameplay [from] day one but we want to further refine our tools to free MMO developers to make richer games and more interesting environments.'

Hence, at the heart of most of BigWorld's scripting is the popular Python, a cross-platform interpreted scripting language designed for clarity and ease-of-use. Developers can whack Python code into the engine while it's running, watch it work, and fix it on the fly without losing game states.

By using Python, certain low-level functions can be altered and implemented that would normally require changing the C++ code that makes up BigWorld. Of course, if a developer wants to change the nuts and bolts, they're more than welcome to tinker with the raw code. Python however allows the average designer to get basic tools and behaviours into the game, either on the fly or offline, without involving a programmer.

BigWorld also comes with a 'traditional' set of creation tools. These include the BigBang World Editor and the Client Access Tool (CAT).



With support for as many players as you have resources, BigWorld makes large scale battles and adventures a reality.

BigBang allows a designer, using 'shells' that click together like Lego, to piece together any number of structures quickly and sculpt terrain via an array of deformation tools, while CAT lets developers tweak almost anything in real time using Python and have it affect the world immediately.

Administration of BigWorld and its servers is handled by a number of programs including the Server Controller and Space Viewer. The Server Controller allows modification of the game on the micro level and according to BigWorld can alter anything from air temperature in a town to the contents of the hand of an NPC or player.

Other tools include the Distributed Logger, which provides comprehensive activity reports on each server and System Graphs that keeps a check on server usage and available resources.

## Conclusion

BigWorld has shown the world at large that Australia can be an innovator in the games industry.

'We've licensed the BigWorld Technology for use in 46 games,' says Spencer. 'One of our favourite customers is NetEase ... one of the largest MMO publishers in China.' After developing a game for two years using BigWorld, NetEase decided to streamline its MMO development process by adopting BigWorld for all its future games.

BigWorld is not only a complete solution it's also cross-platform. According to BigWorld, the technology is more than capable of accommodating both PC and console users. The server software naturally works on open source operating systems like Linux.

'We're working on expanding the functionality of the BigWorld Technology suite further and also are putting a lot of effort into developing our toolset to help make MMOG development easier,' says Spencer.

'Our focus is to allow game developers to concentrate entirely on the one thing that matters, creating the best gameplay. Everything that gets in the way of that goal is a problem that we're working on.'

## THE CHINA SYNDROME

Recently, the Government of China put into place a policy that requires all popular MMOs in the country to abide by certain play restrictions. After three hours of gameplay, players have their characters crippled, until eventually the game provides no loot and experience benefits. This crippling subsides after five hours of no play. The MMOs affected by this included Legends of Myr 2, World of Warcraft and Lineage.

What problems did this pose for BigWorld as an MMO middleware that's extremely popular with Chinese game publishers?

'It's something that our licensees can implement themselves, although we provide example code that shows one way of doing it. The ongoing maturation of the Chinese MMO industry is good for our business because it means that budgets increase as the industry gets more competitive and the benefits that BigWorld brings can be more fully appreciated,' says Spencer.





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Despite media reports, the 'rose-coloured glasses' are not a tribute to Johnny Farnham.

# Psychonauts

Logan Booker is killing yaks from two hundred yards away with mind bullets.



hotaward

With Tim Schafer at its helm and games like Day of the Tentacle and Grim Fandango as a pedigree, Psychonauts was destined to be something special. What the former LucasArts designer and his company Double Fine Productions has done is salvage what it could from the dead adventure game genre, inject it into a 3D platformer, and branded it as 'Psychonauts'.

And it looks good.

In Psychonauts, you play Rasputin, a kid who lives in a world where people with psychic powers are an alienated minority. Unsurprisingly, Rasputin is one of the lucky few with mental abilities – or should that be unlucky few? Rasputin, forced by his narrow-minded parents to ignore his powers and pursue more mundane activities, runs away from home to a psychic 'summer camp' called Whispering Rock. It is here that he discovers children just like himself, training to harness their powers and become elite agents (or 'psychonauts') – as well as realising his own exceptional talents.

Psychonauts involves a lot of running around – talking to your fellow psychic campers,

uncovering 'Psitanium'

arrowheads (the game's currency) and

increasing your

Psi Rank to

earn more

powerful

abilities. To

these ends, the

game is split

into two parts:

one has you travelling

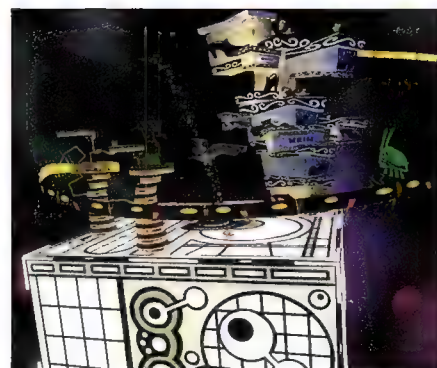
in the real world, where you buy equipment, chat and collect arrowheads, while the second involves venturing into people's minds, waging war with various hostile mental projections and chasing after figments of the imagination.

As open-ended as this sounds, the story is really quite linear. A regimented series of awesomely-scripted, well-acted and witty cut scenes and movies overtake much of the actual gameplay.

While watching each exchange, be it between Rasputin and the camp bullies or mysterious agent Sasha Nien, is not compulsory, they're by far the most entertaining part of the game. The intro movie, which easily weighs in at 5-10 minutes, sets the mood almost perfectly and once you begin the game proper, the environment and characters all feel 'right'.

Double Fine's dedication to making what is easily the best story in a game since Grim Fandango has come at the expense of the gameplay. It almost feels as though the developers created the characters and movies and then tacked a game on top. Psychonauts also suffers from *console-port-irritus*, with some references to thumb sticks sneaking into the tutorials and key bindings menu. As a result of its console heritage, the controls in-game feel clunky and aiming, even with the lock-on feature, could have been implemented better.

Despite these minor problems it's still a damn fun, refreshing game with impressive graphics for a console job. If you're a diehard fan of adventure gaming and in dire need of a fix, you probably won't find salvation at the hands of Schafer and his psychonauts, but it should take the edge off the cravings – maybe just long enough for the Sam & Max sequel.



Double Fine  
QVS  
[www.doublefine.com](http://www.doublefine.com)

2GHz P4; Athlon; 512MB RAM; 128MB  
GeForce FX 5600/Radeon 9600; DX9c

## VERDICT

Awesome, fresh plot and characters; mostly cool gameplay, freedom of play



Console port; too much focus on the story, parts of the gameplay suffer.



score

9.0  
OUT OF 10



PERIPHERALS FOR  
THE SERIOUS GAMER



JOYTECH





Thanks to the wonders of political correctness, the raping and pillaging aspects of conquering the new world have been thoughtfully left out.

## Age of Empires III

**Ben Mansill** chops down trees to build a barracks and train Pikemen.

There's a friendly familiarity you get when loading up Age of Empires III. It's so familiar, in fact, that it actually takes a while to discover the small differences that make this game worth buying for Age fans – this could be Age II, or even Age I, it looks and plays so similarly.

Which is by design. We met with Ensemble's boss Bruce Shelley a couple of months ago and he asserted the design ethos that the less that's changed, the better. Bruce believes that there's a critical mass of activity a gamer can handle, and too much ruins a game. So if you've played any previous Age game, Age III is like an unusually large add-on.

What is different is the new age, which this time around is the New World – the wondrous South American culture before the Spanish raped it, and the peaceful American Indians, before the English and French blotted them out. In the game though, political correctness ignores all that. The natives themselves are

ready and willing to join your cause and play a strategic role in the game. Native towns can be bought, in effect, and can then be used to raise native armies. They also offer nice power-ups that you can't get without them.

A significant new gameplay aspect is the introduction of trade routes, or big old roads that run through the middle of a map. Along these are usually a couple of stations which you can claim by building on them, then you get free resources every couple of minutes. This is very handy indeed, and obviously strategically desirable in multiplayer games. Against the computer though it is rare that the AI will make any real effort to claim either trade routes or natives.

The last biggie is the Home Port, which operates as a kind of warehouse that makes things like resources, power-ups and extra units available through the game via 'cards'. As you play the game you'll level up and more cards become available. Whenever you need new stuff – or remember to check – you can click to



visit your Home Port, which then dispatches a frigate capable of light speed travel to deliver your goodies a few seconds later. It's all a bit of a gimmick for the single player campaign, but the gift of a few cannons right when you're under siege isn't something to sniff at.

You essentially have three game modes to enjoy. Singleplayer, AI skirmish or multiplayer skirmish. The skirmish modes are great fun and, from our perspective, far more enjoyable than the singleplayer missions. Even playing the AI in skirmish gaming is challenging and cool. It's close in styling to the original Age as well, with big maps and everyone starting with virtually nothing. Singleplayer missions, in contrast, are a mixed bag of set piece missions with loads of triggers that you'll progress through. There's not a big emphasis on base building or resource management in these missions, they are instead the sort of custom RTS missions you either love or hate. Typically you may be given a party of a few soldiers guarding someone important as you make your way from one corner of the map to another. If you hate these, well, there's lots of them in Age 3. Balanced against that are some quite spectacular singleplayer missions that offer clever and unique gaming. Like manning a huge fort against relentless invaders while you strive to get the most benefit from scant resources, or starting out small on an island, building a base so you can afford ships, then trucking off across





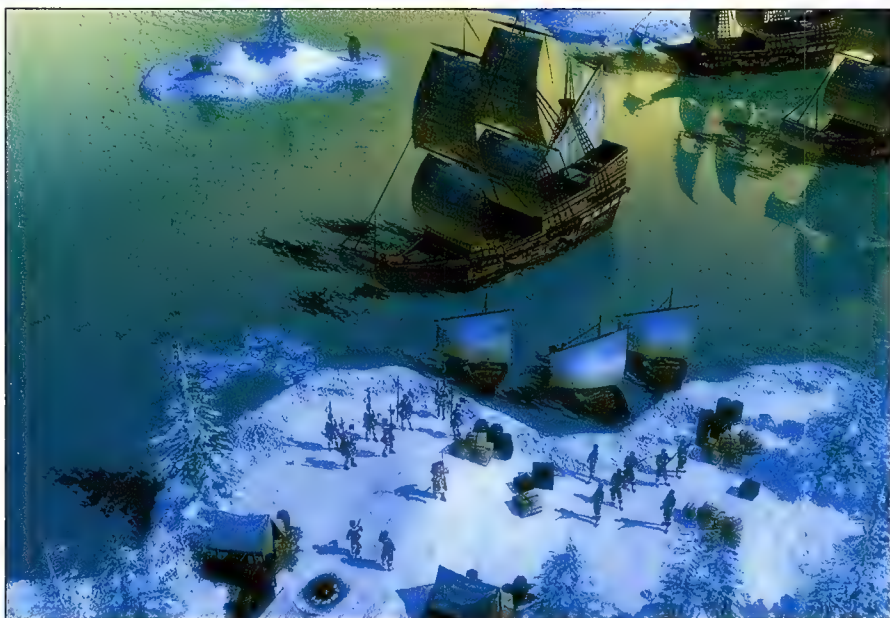
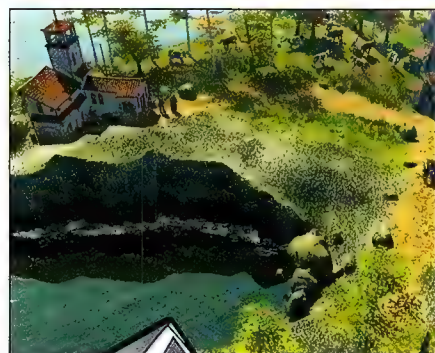
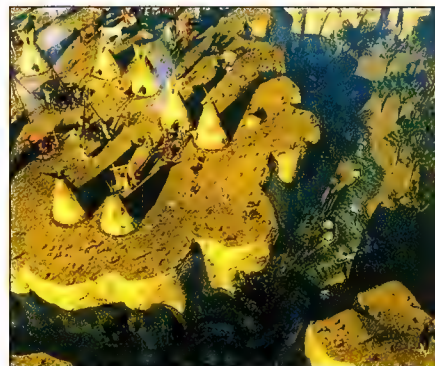


the ocean to another island to build a base all over again and wipe out the bad guys in the corner – great fun! Those missions keep interest high during the campaign, which is separated into three acts of a dozen missions in each. Unless you rush things you can count on about an hour per mission, giving you a whopping 30 or more hours of gaming for the campaign alone. Really though, skirmish mode is where it's at. There's enough breadth in the difficulty levels and map types to keep you gaming for as long as it takes to make you completely sick of it. But we've been at it for a month and still get a kick out of trying new tactics or playing different races.

There are eight races, or 'civilisations' (let's not forget where Bruce Shelley got his start in

game development – he's a Sid Meier protégé). Each is different in enough ways to alter the way you base-build, but overall strategy doesn't really change as the differences are subtle. You'll get a unique unit or two for each race and a few resource management benefits. Ultimately none of it really matters because the game rewards you for sticking with a particular race by opening up their range of power-ups the longer you play with them. A rather odd design decision, as it doesn't encourage experimenting with different races.

But all up it's like putting on your favourite old coat after it's been dry-cleaned. Age 3 is a lovely game designed by clever people. It's just nice to play and the many, many hours of gaming in the box make it special value too.



PC

Developer **Ensemble Studios**  
Publisher **Microsoft**  
Website **www.ageofempires3.com**

Recommended  
Win XP; 1.4GHz CPU; 256MB RAM;  
hardware T&L video card.

## VERDICT

Perfect balance between resource management, base building and combat. 

Can't adjust game speed in Campaign; field of view too limited. 

score

# 7.0

OUT OF 10



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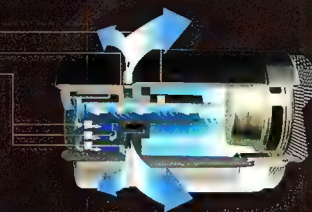
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If you've been waiting for the game that lets you play out the best scenes from the *Matrix* movies, well you should probably stop waiting because *Path of Neo* is about as close as you're going to get.

Unlike 2003's *Enter the Matrix*, *PoN* actually lets you play the hero this time around and gives you the opportunity to relive some of the more exciting sequences from the movies in faithfully recreated environments.

Though movie licenses are seldom the immersive experience they claim to be, playing through sequences such as the lobby gunfight from the first movie gives a feeling of satisfaction not normally found in movie-based games.

Unfortunately, getting far enough into the game that it starts to become enjoyable is a challenge in itself as the introductory levels are, for lack of a better phrase, really, really bad.

Though the tutorial levels do get you accustomed with the controls (and they will take plenty of getting used to), they go on for far too long and are quite tedious. However, if you can persevere, there is quite an enjoyable game hidden away in there.

The hand-to-hand combat system

is particularly well implemented and fighting multiple opponents is the most fun you'll have in the game. The idea is that you tag several enemies before unleashing an attack that results in more noggins knocking and eye poking than a *Three Stooges* act.

Unfortunately, the rest of the controls aren't so intuitive. The camera needs frequent manual adjustment and due to animation inconsistencies, you can never tell if Neo actually has a firearm equipped. Since your guns only appear when you try to fire them, it's not uncommon to step out from behind a corner with fists swinging. Often you'll find it easier if Neo keeps it in his pants and just goes all Jackie Chan on the bad guys.

For a game that follows the story of the movies so closely, it's surprising that the recut footage that's used to break up the levels has almost nothing to do with what is actually happening in the game. It's not so much that the footage has been 'recut' – it's more like it's been butchered and stitched back together in such a manner that it will most likely coerce the acronym 'WTF' from the player. It is a real distraction from the potential of the game.

Despite all of these issues, as far as movie based games goes, this is one of the better ones – although the *Max Payne* series still has the better implementation of bullet time. Though the game does get better as you persevere, perhaps only fans of the movie will have the stamina for it. And if you do happen to fall into that category, do yourself a favour and get one of the console versions of this game.



**PC**

Shiny Entertainment  
Atari  
[www.atari.com/thematrixpathofneo](http://www.atari.com/thematrixpathofneo)

Requires: 1.8GHz processor; 1GB RAM; 6GB HDD; Windows 2000/XP.

## VERDICT

You get to play the hero this time; as movie based games go, this is above average.

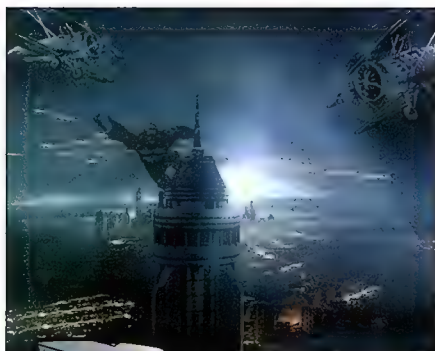


Controls take some getting used to; recut movie footage makes no sense.



score **7.0** OUT OF 10





XBOX

Ubisoft  
Ubisoft  
www.kingkonggame.com  
1  
All

## VERDICT



Great graphics and immersive gameplay from start to finish.



Completely linear, once you're done there's not a lot to go back for.

score

8.5  
OUT OF 10

Kong only needed a strike to ensure his victory in the super-monsters bowling championship...

## Peter Jackson's King Kong

Ron Osborn avoids the obligatory monkey spanking reference

Let's face it, games based on movies generally suck. Trying to recall a really good one is like trying to find a good kebab shop when you're sober – it's not going to happen because you need to be under the influence for such a thing to exist.

And that's why King Kong is such a surprise. You see, it's actually quite good. From the treacherous waters on the approach to Skull Island through to Kong's rampage through the streets of New York, you really feel immersed in the game.

For the most part, you play the part of Jack Driscoll, scriptwriter and all-purpose hero, stuck on an island full of dinosaurs with a group of people trying to make a film – about not getting eaten by dinosaurs.

You won't find any loosely linked narrative trying to justify the existence of a level in this game. The story unfolds through the actions and events experienced by your party. Characters talk to each other, offer up hints, call for help and even come to your aid. Though the game is completely linear, you feel like you're playing a part in the story rather than having it told to you.

Playing an equally important part in that story is a very big monkey, and thankfully you get to control him too. The Kong levels serve as an interlude to the first-person

sections and are just damn good fun. There's nothing quite as satisfying as watching a big ape get surly – except perhaps having control over him as he does.

To add to the immersive feel of the game, there is no HUD. Jack calls out the ammo count on each reload, and when you take damage the screen goes all hazy and a choir starts to sing – it's like getting punched in the face outside of church on a Sunday morning.

The increase in difficulty is adequately paced over the twelve or so hours you spend playing the game and you'll seldom find sections that you can't overcome with a bit of perseverance. Unfortunately, with no hidden areas to explore or secondary objectives to achieve there's very little reason to go back to the game once you've finished it.

That said, while it lasts it is really good, and while we can't vouch for the quality of the game on the myriad of platforms it's being released on (Kong on your mobile, anyone?), the Xbox version looks great.

Normally a multi-platform release signals a short development cycle and a spread-out budget, but somehow King Kong has come out on top.

King Kong proves that making a game out of a movie doesn't just have to be an exercise in leveraging sales on the back of an established brand name – you can make a good game out of it too.





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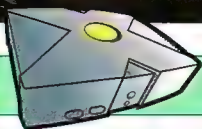
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1

PC

## VERDICT



Great tension and use of fear elements; good use of themes and involving story.

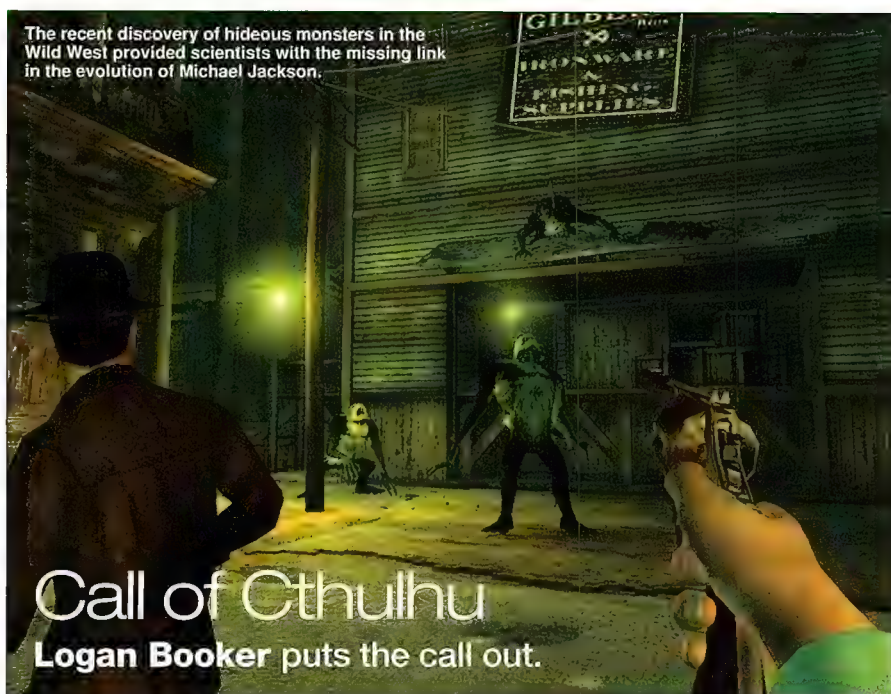


Environments too dark; imprecise controls; low production values.

score

8.0  
OUT OF 10

The recent discovery of hideous monsters in the Wild West provided scientists with the missing link in the evolution of Michael Jackson.



Call of Cthulhu  
Logan Booker puts the call out.

Hey, if Shub-Niggurath worked for Quake, then the entire gamut of H.P. Lovecraft's demented creatures should surely be able to create a wonderful gaming environment for one to crap their pants in. If anything is going to make you dump a lump, it's Lovecraft.

Innsmouth, a spooky 19th century fishing town and a private eye called Jack Walters are the main set and protagonist respectively for developer Headfirst Production's survival horror FPS, Call of Cthulhu. Where other games in the genre have guns and grenades, all CoC has is the rear view of Jack's girly hide as he runs for his life from terrors unknown. This game is about hiding, blocking entryways and engaging in other less than heroic acts while you search for clues to help uncover the mysteries of Innsmouth and Walter's own dark past.

Lovecraft's otherworldly creations have a distinctly crustacean appearance – from the scaly Deep Ones to the tentacled Cthulhu itself – and CoC does a half-decent job of doing these creatures justice. Unfortunately, the game's low production value shows in the textures and polygon counts, which leave a lot to be desired. Regardless, it's good enough to deliver the scares and keep the suspense airborne in volumetric fog, but it won't be overtaking the likes of Doom 3 anytime soon.

And about those production values! For a game focused (and dependent) on enveloping the player in fear and blanketing their senses with creepy sound effects, listening to the voice acting is like being beaten over the head with a pillow full of shurikens. The dialogue at points

is painful enough that it will stick with you long after the memories of your octopus-like demonic assailants have faded.

CoC manages to make up for this with its gameplay mechanics. The removal of a HUD (which would normally be a negative point) adds much to the atmosphere – with no idea of your current health or ammo the suspension builds quickly. Add to this the sparsity of guns, health and bullets, and it won't take long before you're allotting rounds (and calibres) to monsters on a piece of scrap paper before each fight.

These mechanics are brought together by a new, unique element called 'Sanity'. Sanity works in a similar way to the fear element in Capcom's flawed Haunting Ground – as the player experiences more terrifying situations, grisly murders and the like, they start to hallucinate, their pulse beats faster (gamepad vibration) and the screen blurs. CoC is extremely detailed in this area, to the point where even heights will induce a bad case of the shakes. When Jack's Sanity hits zero, it's game over.

This doesn't replace your physical health – that's there too. CoC starts to get a little anal-retentive here, requiring certain medications to heal specific wounds, but the realism is unparalleled and the fear a raw distillation of what survival horror should be.

Resident Evil and Silent Hill fans might not like the lack of confrontation in the game, but if you love these titles for the scares and tension, then Call of Cthulhu is worth a look.



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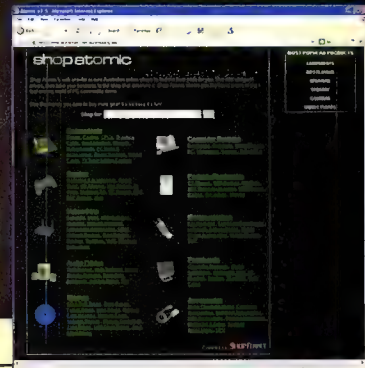
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## I/O OF THE MONTH

### Atomic batteries to power, 15k rpm drives to speed...

What sort of performance boost would you expect to get if you went from using ATA133 drives to SATA, SATA2, Ultra320 SCSI, or Fibre Channel?

Sean D

'Bugger all' best describes the performance boost you'd get.

The big bad SCSI buses have huge bandwidth – 4GB/s for the fastest current FC bus, or something like 400 megabytes of real user data per second. Higher speeds are around the corner for FC and Serial Attached SCSI. They need this to support lots and lots of drives, separately or in arrays.

The very fastest consumer drives, as I write this, have raw unformatted read rates up around 65MB/s for the outer tracks, and under 40MB/s for inner tracks. The best high capacity 10,000rpm server drives push that to around 90 and 50MB/s, respectively (thanks to higher spindle speed), and the craziest 15,000rpm drives today have managed to inch a little further ahead again, at around 100 and 75MB/s, respectively (they're not as fast as you might think, because they've got lower capacity).

So, if you've only got one drive, a '133MB/s' interface will be more than fast enough, even after you allow for the difference between ATA specs and what you actually get in the real world. SATA150 can handle anything that'll be thrown at it for a while, since each port supports only one drive.

Server drives beat

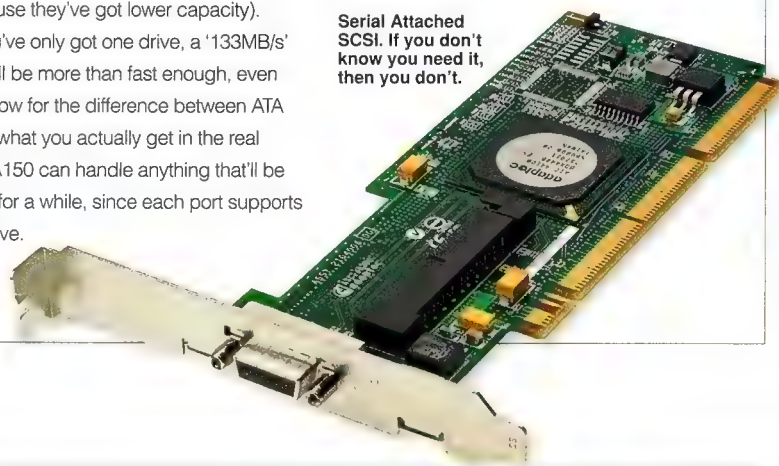
consumer drives for access speed thanks to faster spindle speeds and physically smaller platters (which explains their capacity limits), but for desktop PC applications this doesn't matter much. If your computer's flogging its drive like crazy then a super ultra turbo drive will make things faster, but a desktop machine that's doing that is probably trying to tell you that it needs more RAM.

If you're doing heavy duty video editing or scientific computing or serving a major database, then the hefty price of a server-grade storage subsystem can be money well spent – not least because server drives, kept properly cool, are much more likely to still work after several years of non-stop hard use.

And if you want to make a RAID array, one of the high speed SCSI flavours (running on a PCI-X server board, by preference; standard PCI or PCI-E x1 don't themselves have enough bandwidth) will let you get really impressive extra speed out of it, as well as the data protection that's the major advantage of ATA RAID.

If you're just doing Regular Computer Stuff, though, then even if you're shifting ISOs around and playing games that come on DVDs, you won't get value for money from server-strength storage. Just buy big consumer drives.

**Serial Attached SCSI. If you don't know you need it, then you don't.**



### IOOTM wins a Logitech G5!

A healthy glow is good for you, as long as you don't work in a nuclear reactor or mine fissable materials for a living



### Read-Only Memory Card

I know that current generation CompactFlash cards have a finite number of write operations they can perform (which varies, depending on the quality of the card). I'm interested in the number of *read* operations they can handle.

Once the data's already been put onto a card, how long will it stay there? Can it be read an infinite number of times? Does it eventually 'leak' or get corrupted?

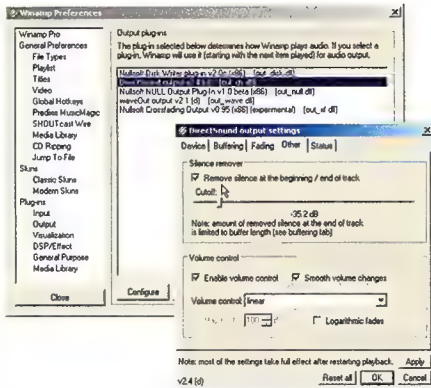
I'm looking at making a small computer device that boots a very thin operating system and a 512MB or 1GB CompactFlash would be ideal. I'm not actually going to write anything to it, just read, but I would like to know if there's a possibility that it might fail at some point down the line.

Michael

You'll be happy to hear that there's no limit to flash RAM read cycles. Well, electromigration or something will presumably kill the card eventually, but if all you're doing is read operations, you can still expect a flash memory card to last for a long time.

Flash memory is highly resistant to corruption; passing energetic particles are much less likely to flip a bit of flash than DRAM, and mechanical, thermal and magnetic attacks aren't much of a problem, either.





Hey – *another* thing you can do to other people's computers to drive them nuts!

## inamp kips he eginning

On some tracks, Winamp doesn't play the first few seconds. It just starts about three seconds in. There's nothing wrong with the files, and they play fine in Windows Media Player (bleagh) or QuickTime (bleagh\*2), but Winamp chops their noses off.

I've reinstalled Winamp, I've reinstalled my sound drivers; nothing helps.

It mainly seems to happen to classical music and jazz. Why?

John Burke

Go to Options -> Preferences -> Plug-ins -> Output -> DirectSound output -> Configure -> Other. My infallible psychic powers tell me you have 'Remove silence at beginning/end of track' turned on.

The slider under that lets you define how quiet Winamp thinks 'silence' is. If a track – like a nice subtle piece of classical music – starts out quieter than that threshold, Winamp will dutifully skip forward until it gets louder. And there's your problem.

## iRockin'

I have a simple question regarding the iRock FM radio transmitter.

Recently my wife and I upgraded our in-car DVD system. No, we don't have a fancy van with an LCD panel, instead, we use my wife's laptop. It occurred to me that the single 1nm diameter laptop speaker sounded like hot liquid arse. So I bought the iRock transmitter to enhance our viewing pleasure.

It runs from 2 AAA batteries, but I was wondering if it could be powered from my wife's USB port? There is also a 12V cigarette lighter version, which would work, if we weren't already using that socket for the 175W inverter hooked up to the laptop (plus, I didn't find out about it until after I bought the AAA model).

Shawn Thomas

Wow. My girlfriend doesn't have any USB ports at all. Or FireWire. Not even parallel.

Perhaps I should upgrade.

Ahem.

Yes, a USB port would definitely be able to deliver enough juice to run a little FM transmitter, but your transmitter expects 3V and USB power is 5V, so you'd very probably need some DC-to-DC conversion stuff, and it'd all be too much trouble.

Get a cigarette lighter double adaptor (a decent electronics store should have them; they're also of course quite simple to make from the parts that practically any electronics store will have, assuming you can solder), and a regulated power adaptor to plug into it that will give you 3V output. Those power adaptors are cheap these days – they often offer regulated 3, 6 and 9V output, and unregulated passed-through 12V, which becomes 13.8V when the engine's running. You'll be able to run the transmitter you have from the power adaptor, with a bit of wire-fiddling.

## First, buy a club hammer...

I've got a Canon EOS 300D, and there's dust in my 24-85mm zoom lens (which I used to use with my film EOS).

I didn't say *on* then, I said *in*. I can see a big chunk of dust on the back of the, um, lens, and it's visible in many photos.

How'd it get in there? Can I get it out? I've tried tapping the lens as hard as I dare, but the dust seems to be glued to the inside of the glass.

Anita Tran

Yes, you can get the dust out, but only if you take the lens apart.

Totally dismantling a zoom lens (separate, or integrated into a camera) is about as fiddly as you'd expect, and not often worth the trouble. It's fine work, and it's easy for an amateur tinkerer to ruin the lens. So if you don't know what you're doing, then either you can afford a whole new lens to replace the one that's full of fungus or whatever, or the thing's so valuable that you won't mind sending it off to the manufacturer to be fixed by the little goblins in their magic castle.

But all *you* need to do is remove the front 'element', as it's called, not take the whole lens apart.

35mm and DSLR lenses are held together in a variety of ways – screw-in rings, C-clips, screws hidden under rubber parts, and the list goes on. You have a recent consumer Canon zoom with a simple black ring around the front element with the lens specs printed on it, though. Those lenses all, I think, have the front element retaining screws under that front ring.

The ring's just a stiff sticker. Start levering it off with a weeny screwdriver in the single little notch on the outer edge, and it's easy to remove (and replace, though it doesn't serve any optical purpose).

Undo the (probably) three little screws you find under the sticker, give the lens an upside-down shake, and the front element should fall out in your hand.

Now clean away. Do *try* not to put the thing back together with a damn great fingerprint in place of the dust on the inside.

Things that are good for cleaning lenses: Puffer-brush bulbs, lint-free tissues, microfibre cloths (often even the cheap two-dollar-store 'glass cloths'), and 'LensPens'. Those last items are, I noticed to my surprise the other day, now on sale along with 'SpeckGrabber' gadgets for picking visible dust off DSLR sensors, in Big W of all places.

Things that are bad for cleaning lenses: T-shirts (yes, even freshly washed ones with no fabric softener), ordinary tissues, alcohol. All of these things can damage delicate coatings on lenses and eyeglasses.

How does the dust get in there? Well, sometimes it comes from some inadequately cleaned internal component, but it usually gets into consumer zoom lenses because they're not well sealed. The common kind of telescopic zoom lens can easily inhale dust as it extends and contracts.

So, unlike sensor dust, this problem can arise for users of integrated-lens cameras, as well as with removable-lens digital SLRs.



'Don't let your forehead sweat drip in there.'



# hotbox

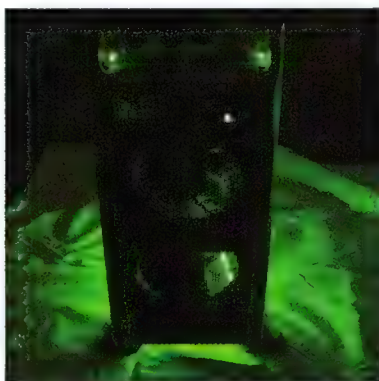
The best reader-submitted custom made boxes every month!

Welcome to Hotbox! Each month you'll find the winning Hotbox of the month and runners up as voted for online at [www.atomicmpc.com.au](http://www.atomicmpc.com.au). Want to win? Submit your box now!

## Blake's Greenflame

I started the idea of Greenflame while staring at my boring old beige box. The case started as a full tower case server with a P3 and SCSI disks. I made CAD designs and after time the perfect opportunity came to create it. It was painted using a compressor and gun and the clear coat is 7008 (nasty stuff). The window is lit with LEDs and engraved with my trusty rotary tool. All this cost a lot more than I had expected and I had to make my own fan controller (cause the damn 120s were too loud). After a small fire in my room when I shorted, it all works well now.

Blake



### technical details

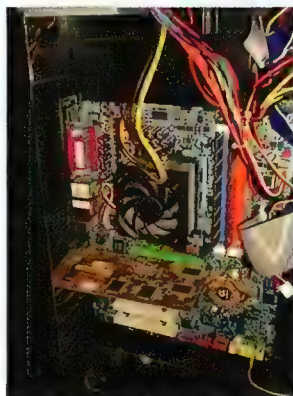
- AMD Athlon XP 2600+ @ 2.1GHz
- 1GB GeiL RAM
- Enermax 420W Noisetaker PSU
- GeForce FX 5500
- Seagate 160GB STAT HDD
- Pioneer 109D DVD burner



## Tobey's Big Black Beast

This is her! The initial idea was to get something as big as I could and put as much stuff in as I could while trying to save as much money as I could, all while using as much of the original stuff I already had. The case has 2 x red 80mm blue fans on top; 1 x 80mm red fan on the back and 1 x 120mm red fan on the front, as well as a 120mm red neon underneath, all controlled by switches on the front panel. The case was an AST Manhattan S Series server case which I completely stripped and painted black inside and out. It stands about 65cm tall and is on coaster wheels due to weight. (The graphics card in the picture is not the current card, just an older photo).

Tobey



### technical details

- AMD Athlon 64 3200+ @ 2.0GHz
- Gigabyte K8NS Ultra 939
- 768MB DDR333 RAM
- ATI RADEON 9600 PROM 256MB
- Sony DVD-/RW Dual Layer 16x
- 500-watt PSU





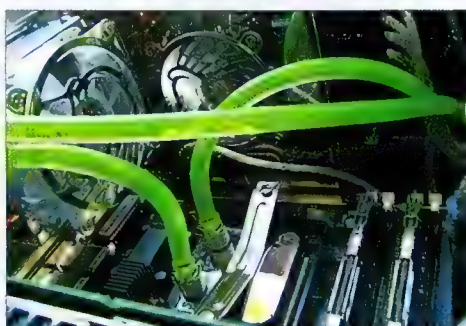
# hotbox OF THE MONTH

hotbox

## Matthew's Predator

I started with a Kingwin-424 case and have dremelled into the back of the motherboard plate to send wires through the back. I have also layered the plate with sound proofing foam to give it a very clean look. Dremelled all the grills on the front and back to open the airflow up, which helped a lot. The case is now covered with sound retention foam. Custom mirror on the bottom of case. Modded the water kit pump/radiator/reservoir kit. Cut out the grill on the tops and grills surrounding it for better airflow to the radiator etc. Also pinched the second radiator inbetween two white 80mm led fans for maximum airflow through the second radiator. This has also helped improve airflow and cooling. Also the removal of top pump kit grill and stock 80mm fan makes it very quiet now to run the water kit at full speed.

*Matthew*



### technical details

- AMD Athlon 64 +3500 @ 2.4GHz
- OCZ Platinum Revision2 DDR400 @ 2-2-2-5
- Western Digital Raptor 74GB
- BFG GeForce 6800GT OC
- Creative Audigy 2 ZS
- A8N-SLI Deluxe motherboard

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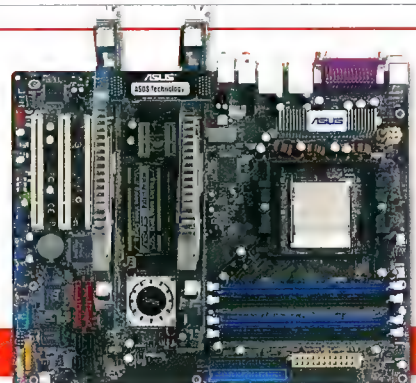
- 3-4 high resolution, well lit, pictures.
- A 250 word description of how you made it, the obstacles you overcame, the tools you used, and your inspiration.
- A detailed list of the machine's specs.

## Hotbox of the month wins an **ASUS A8N-SLI Deluxe!**

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# matchbox

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We've specced and built a beast machine, but can you beat it? Is your PC faster? Prove it!

In these pages we will feature contenders to beat the Matchbox machine. Both will be run through a gruelling set of benchmarks, and

the winning box announced. If your box can beat ours then fame, glory, and the adulation of the opposite sex await you. Oh, and super-spankworthy prizes too! But even if victory doesn't come, your box will henceforth be listed on this page as one of the fastest machines in the country, if not *the world*.

**Here's how it works:** You can see our Beast Box below. Lets call it *Version 1.0*. You've got some of the specs, so you have an idea of what you need to beat it. Use all your resources. Hardware and overclocking, cooling and modding, drivers and registry tweaks. Whatever

it takes to build the fastest box in Oz.

Submit the details via email and we'll take it from there to arrange benchmarking in the Atomic Labs. The machine with the highest score wins. It's that simple.

The configuration of the Atomic box will stay the same until it is beaten. So if one contender doesn't beat it, it's onto the next. Then, like Hotbox, we'll gather together all the winners at the end of the year for a final battle of who can build the beefiest box, and win a grand prize so supreme it makes supreme pizza look like Hawaiian. So are you hardcore enough?

## ATOMIC'S BEAST BOX 1.0

Motherboard  
**ASUS A8N32-SLI Deluxe**

CPU  
**AMD Athlon64 FX57**

Memory  
**2GB OCZ PC4000 EB Platinum**

Graphics  
**2 x Leadtek 7800GTX TDH Extreme SLI**

Storage  
**2 x WD 10k Raptor 74GB in RAID 0**

Cooling  
**Thermalright XP120 + 120x25mm fan**

Power  
**Coolermaster 550W PSU**

**The rest of the stats like timings and clocks... we can't give too much away!**

**Build a box to beat it, or submit your ready-made machine, and enter matchbox.**

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Submit your box details to [matchbox@atomic.com.au](mailto:matchbox@atomic.com.au).

Send pictures, your name and address, and a contact phone number.

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**Q Who is credited as having invented the interweb?**

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## 1 x inMotion IM7 boom box

Speaker systems for iPods generally get a bad rap, mainly because they're small and tinny, and just don't have the power to give your music the whump of bass it needs. This isn't the case with Altec Lansing's inMotion IM7 boom box which is, in every way, a testament to the portable powered boom boxes of the 80s - it's big enough to rest on your shoulders, and loud enough to wake up the office block. Heck, it even looks like one. A neat rubber lined inner handle makes it easy and comfortable to carry around, so you can bop to your Kylie at home and then take it with you to wake up da homies with some Eminem. As the best iPod speaker set we've yet heard we had to convince Altec Lansing to give a set away, for which they graciously agreed. It's valued at \$399, and if you've got an iPod (and who doesn't?) you want this funky piece of kit!

**Q When was the original iPod released?**



## 5 x Woddles Penguin Waffle Maker

Nothing pulls the chicks better than a man who can cook waffles. And if they're super-special penguin waffles with a hollow belly for ice cream and maple syrup goodness, you might as well put up a sign up on your door saying 'Queue here, ladies!' because you're going to be busy. The fact the penguins look like a long lost cousin of Tux explains the odd attraction the Atomic boys had to this wonderful device. 'You mean, it makes Tux and I can eat him?' \*swoon\*. Seriously, how f\*cking cool is this? It's got pride of place in our office, right next to the Warcraft Orc costume, which we dress Logan up in on Fridays.

Thanks to Sunbeam we have five of these awesome chick magnet waffle makers to give away. Don't delay! You too could be cool and hot!

**Q Which real life penguin species inspired Linus to use a penguin as the mascot for Linux?**

To enter visit [www.atomicmpc.com.au/competitions](http://www.atomicmpc.com.au/competitions). The closing date for entries is 7 December 2005. Winners will be announced in *Atomic* 62. Atomic 58 winners. 1 x Engin VoIP-enabled Linksys broadband wireless router Q Which company recently acquired VoIP provider Skype? A. eBay. J. Ryan, Freshwater, QLD. 1 x Logitech G7 wireless laser mouse Q Who coined the word 'laser' in 1957? A. Gordon Gould D. Payne, Bendigo, VIC

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...what was the first PC you ever bought with your own moolah?

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# websight

A hands-on look into the awesome Atomic community.



**Moz:** Where'd Virt go? Why are we writing this now?

**Hulks:** Dunno mate. I think that it's just a tag-team effort. You ready to run with it?

**Moz:** Sure. Although it's got me buggered how you can run with legs like that.

**Hulks:** Jealousy is a curse. Speaking of jealousy, did you see the recent rash of threads that popped up dealing with love in all its shapes and forms? It would have made anyone think that Cupid had paid a special visit to our digital playground. But of course, love doesn't always have to involve rumpy-pumpy. Games hold a special place in our hearts and Hectorbustnuts loves his F.E.A.R. so much he had to tell the world.

[www.atomicmpc.com.au/forums.asp?s=3&c=12&t=9732](http://www.atomicmpc.com.au/forums.asp?s=3&c=12&t=9732)

**Moz:** You really should see a doc about that rash. Speaking of fear, it seems that many others love the fear too... So much so that many a Mum will be washing soiled undies for days. Not quite the same fear morris will feel when he undoes that first nappy after morris' junior's arrival though. Hand him those wipes and clear the room!

[www.atomicmpc.com.au/forums.asp?s=1&c=1&t=71796](http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=71796)

**Hulks:** Good thing you're still in nappies.

Fun and games continued as BedeM got all hot and bothered for Quake 4 – and then bragged about it to anyone and everyone who would listen.

[www.atomicmpc.com.au/forums.asp?s=3&c=12&t=9749](http://www.atomicmpc.com.au/forums.asp?s=3&c=12&t=9749)

Sounds a little too much like Juggs getting all hot for Cheeky for my liking!

**Moz:** Pity you have nothing to brag about. Mind you, life on the forums doesn't always revolve around our passions. Saponification asked some interesting questions about the alleged atomic 'in crowd' and a lively debate followed.

[www.atomicmpc.com.au/forums.asp?s=1&c=1&t=73585](http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=73585)

And twinair, bored with the normal run-of-the-mill news reports, broke the big story with the alleged death of Bush.

[www.atomicmpc.com.au/forums.asp?s=1&c=1&t=71613](http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=71613)

I also had a bit of a chuckle as deathk took his life into his own hands in spectacular fashion, taking on the female members of the community as he attempted to explain the impossible. His rundown on female shoes is an accurate example of why well-enough should be left alone. He's a braver man than most!

[www.atomicmpc.com.au/forums.asp?s=1&c=1&t=73033](http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=73033)

**Hulks:** We should ask him to explain why you smell so bad next. Maybe the smell was getting to Nich too, as he went on an

epic anti-spam spree that no one seemed to understand. Virt did his best to help, renaming spam 'Albert'. That seemed to satisfy everyone.

I still don't get it.

One thing I do get is birthdays. Gotta love 'em. Even if you and Mills have far too many. In true Atomic form, DonnGEM has done her best to make it easier to remember those important dates with her 'Atomic Birthday thread'

[www.atomicmpc.com.au/forums.asp?s=1&c=5&t=1293](http://www.atomicmpc.com.au/forums.asp?s=1&c=5&t=1293)

**Moz:** Even with seven birthdays a year, I'll still never catch up to you Old Man. Some may have noticed that this column is going through a few changes. Our resident alien, Virtuoso, asked the question – What would you like to read in Atomican?

[www.atomicmpc.com.au/forums.asp?s=1&c=3&t=2025](http://www.atomicmpc.com.au/forums.asp?s=1&c=3&t=2025)

Atomicians were only too pleased to answer. Bigger, better and more community was the cry! We've done our best to provide that for you, but if you want more, get yourself online and join in the big fun that is the Atomic forums!

**Hulks:** The only way you'll get more is by putting a bag over your head.

**Moz:** Like yours?

**Hulks:** Shut up.

## post of the month

[www.atomicmpc.com.au](http://www.atomicmpc.com.au)

A couple of months ago BeDLam#29 put the call out for Atomicans to share a little about themselves, with a bunch of personal questions. Without fully understanding why, Atomicans by their hundred responded.

Then... oh me oh my... BeDLam#29 came back after a month of what we now know to be damn hard work, with this wonder:

**The Third Type of Lies**  
[www.atomicmpc.com.au/forums](http://www.atomicmpc.com.au/forums)

[asp?s=1&c=1&t=74103](http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=74103)

Which is indisputably POTM 60.

What BeDLam#29 created is a quite beautiful presentation of his survey results. Everything is graphed and coded in Atomic green and black, and is both great fun to look at and play with, as well as showing us who we, collectively, are. If that weren't enough, BeDLam#29 also took the time to write an essay from the perspective of the average Atomican. /applause.

It all blew us away and prompted Atomic to create an all-new are of the site to host such wonders – Atomic Gold.

See it all here: [www.atomicmpc.com.au/atomicgold.asp](http://www.atomicmpc.com.au/atomicgold.asp)

You have a Logitech G5 coming your way BeDLam#29. You've also won the everlasting respect of every Atomican. Bravo!





# fallout

Funnies and  
humour from the  
fallout zone

## Crap Game Syndrome

Logan Booker tries to stave off the CGS epidemic.

A box of what you could call questionably exciting games landed on Ashton's desk the other day.

I threw a cursory glance at the bland container, its appearance much like any other box that you might see in a warehouse, or on a street corner sheltering a hobo. Boxes in *Atomic* HQ however have a tendency to last less than a nanosecond unmolested – whether they hold the latest in high-tech gear or harbour the destitute. This box was no different.

The insides were home to nothing more than a pile of CD cases, wrapped in packaging so colourful it had to be depriving a rainbow somewhere of its palette. Amusing packaging, yes, but nowhere near as amusing as the CDs themselves.

Do you remember ever walking into a newsagency and seeing one of those spinning plastic displays that was home to all manner of shareware apps and games? Well, it was as if someone had raided one of those displays, stuck their loot in a box and sent it to us.

The contents, which included such wonders of modern software development as 'Super Tetris World XP', 'Moving Message Display' and, my

personal favourite, 'Space Ball', reminded me of the days when I would scold Chris, my brother, for downloading or even worse buying software of dubious entertainment value. Credit where credit is due, he'd always find a way of eking out at least a day from anything he'd come across to the detriment of the family PC, stripping it and himself of any dignity they may once have had.

**The only thing left to do was break down crying, but even my schoolgirl blubbering wasn't enough.**

During one of his 'episodes', I happened to coin the term CGS, or Crap Game Syndrome (now Urban Dictionary approved). It's an incurable malady that can strike at any time, much like the desire for a Micky D's cheeseburger or Marburg hemorrhagic fever. Chris was a textbook case, and it wasn't until I caught him sweating to the 1990s classic *Hard Nova* while Baldur's Gate 2 lay forgotten by his side that I sat him down (not that he stood up that much) and told him he had a problem. As expected, he refused to accept

anything was wrong, shook his head and went right back to it. Seconds later the loading screen for Derek Smart PhD's *Battlecruiser 3000AD* was up on the monitor. At that point the only thing left to do was break down crying, but even my schoolgirl blubbering for which I am famous wasn't enough to tear him away.

CGS is not always a bad thing. Without it I would never have discovered classics like the *X-Com* series or *Castle of the Winds*. There's nothing wrong with searching on the Web every so often for genres you like, because eventually you'll turn up gems like Ambrosia Software's *EV Nova* ([www.ambrosiasw.com](http://www.ambrosiasw.com)).

Even a few years on, I have no doubt that my brother will be playing the likes of *Circuit's Edge* tonight as the rest of us enjoy what today has to offer.

Unless you have CGS too.

THE  
GEEK  
SPEAK



by Logan Booker





## Don't forget to upgrade before you upgrade



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